August 18, 1934

SEP -4 1934

THE LANCET

Offices: 7, Adam Street, Adelphi, W.C.2.
Telegrams: Lancet, Rand, London. Telephone: Temple Bar 7228 and 7229

No. VII. of Vol. II., 1934. LONDON, SATURDAY, AUGUST 18, 1934. Pp. 104—Price 1s.
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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Problems of Gall-stones. By E. R. FLINT, F.R.C.S. 343

The Toxæmias of Pregnancy. II.—Significance of Symptoms and their Treatment. By DAME LOUISE MCILROY, F.C.O.G., M.R.C.P. 345

Association between Neurosyphilis and Cardiovascular Syphilis. By F. H. HEALEY, M.D., D.P.M. 350

Pentnucleotide Treatment of Agranulocytic Angina. By J. F. WILKINSON, M.R.C.P., and M. C. G. ISRAELS, M.B.—*(Illustrated)* 353

Agranulocytosis Complicating Typhoid Fever. By W. K. BLACKIE, M.D. 355

The Fate of Follicular Hormone in the Living Body. By Prof. B. ZONDEK, M.D. 356

Thoracoscopy by Single Puncture. By F. G. CHANDLER, F.R.C.P.—*(Illustrated)* 357

The Lysis of Pneumococci by Sodium Desoxycholate. By A. B. ANDERSON, M.R.C.S., and P. D'ARCY HART, M.R.C.P. *(Illustrated)* 359

Dermatitis due to Linseed. By R. AITKEN, F.R.C.P. 360

REVIEWS AND NOTICES OF BOOKS

Green's Manual of Pathology. Revised by H. W. C. Vines, M.D. 361

Morality and Reality. By E. Graham Howe, M.B., D.P.M. 361

Early Forerunners of Man. By Prof. W. E. Le Gros Clark, F.R.C.S. 361

Applied Physiology. By Prof. Samson Wright, F.R.C.P. 362

Coccidia and Coccidiosis of Domesticated Game and Laboratory Animals and of Man. By Elery R. Becker, D.Sc. 362

LEADING ARTICLES

THE DEATH PENALTY AND THE PUBLIC 363

ECLAMPSIA AND ANTENATAL CARE 364

THE SIGNIFICANCE OF GLYCOSURIA IN LIFE ASSURANCE 365

PREVENTION 366

ANNOTATIONS

The Cod-liver Oil Treatment of Wounds 367

X Ray Treatment of Actinomycosis 367

The Bronchial Muscle in Asthma 368

Licit and Illicit Traffic in Dangerous Drugs 368

Foreign Bodies in the Abdomen Following Operation 369

Factory Health and Hazard 369

A Regimen for Rheumatism 370

Gastro-jejunal Ulceration 370

Treatment in the Oxygen Chamber 371

Aids to Cholecystography 371

The Backward African Native 371

PROGNOSIS

XV.—Prognosis in Cretinism. By Sir HUMPHRY ROLLESTON, M.D. 372

PANEL AND CONTRACT PRACTICE

A Survey of the Year.—Ethics and Contracts at Home and Abroad 382

SPECIAL ARTICLES

British Medical Association: Section of Neurology, Psychological Medicine, and Mental Diseases: Differential Diagnosis of Functional and Organic Nervous Disorders 373

Section of Radiology and Electro-therapeutics: Diseases of the Genito-urinary System 375

Section of Orthopædics: Adolescent and Senile Kyphosis 378

Sections of Obstetrics and Public Health: Results of Antenatal Care 379

Budapest: Racial and Professional Salvation 380

Brussels: A Bill to Regulate the Sale of Alcohol 381

Medicine and the Law: Forceps Left in Patient's Body.—Diphtheria Patient leaves Hospital. 381

Infectious Disease in England and Wales 388

CORRESPONDENCE

The "Gas Wedge" in the Ætiology of Fistula-in-ano (Dr. R. Young Kenny) 384

Does the Punishment Fit the Crime? (Dr. F. A. Phillipps) 384

Buying Centres (Dr. Alfred Cox) 384

Pituitrin for Herpes Zoster (Dr. S. C. Lewsen) 385

Industrial Dermatitis (Dr. Sibyl Horner) 385

Coronary Thrombosis and after 385

THE SERVICES

Royal Naval Medical Service.—Army Medical Services.—Royal Army Medical Corps.—Indian Medical Service.—Royal Air Force.—Colonial Service.—Deaths in the Services 388

OBITUARY

Prof. Bertram James Collingwood, M.D.—*(With portrait)* 386

Col. William Edward Collins, M.B. 387

George Alexander Moorhead, M.R.C.P. 387

The late Dr. Robert Laws 387

MEDICAL NEWS

University of Cambridge 389

University of London 389

Liverpool Royal Infirmary 358

Radium for King's College Hospital 360

Metropolitan Hospital Sunday Fund 383

London Hospital Medical College 389

A Congress of Medical Wine-lovers 389

Experiments on Living Animals 389

From Theatre to Hospital. 389

An Artificial Slum 389

Memorial to David Livingstone 389

A New West Riding Mental Hospital 389

Tunbridge Wells Hospital. 389

University of Durham College of Medicine 389

INDEX NOTICE

Index to "THE LANCET," Vol. I., 1934 390

NOTES, COMMENTS, AND ABSTRACTS

"Heart" Latham. By Prof. MAJOR GREENWOOD, F.R.C.P., F.R.S. 391

New Preparations: Tannaflavin.—Menostaticum 394

Maternal Mortality and Antenatal Supervision 394

Appointments 390

Vacancies 390

Births, Marriages, Deaths 390

Medical Diary 394

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TABLE OF CONTENTS

The Student's Preparation. By Sir GEORGE NEWMAN, K.C.B., M.D., F.R.C.P., Chief Medical Officer of the Ministry of Health and the Board of Education.

Ventilation, Sunshine, and Clothing. By Sir LEONARD HILL, M.B., LL.D., F.R.S., General Supervisor, St. John Clinic and Institute of Physical Medicine.

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PROBLEMS OF GALL-STONES

BY E. R. FLINT, M.B. Leeds, F.R.C.S. Eng.
SURGEON TO THE GENERAL INFIRMARY AT LEEDS

IN abdominal surgery apart from acute appendicitis the pathological condition most often found is cholelithiasis and its complications; yet, frequent as the lesion is and common as are the remedial operations performed, there are many problems relating to both which are not satisfactorily solved. For example, as regards the former, are gall-stones primarily due to some chemical disturbance, and, if so, what nature, or do they form secondarily to an infective cholecystitis? As regards the latter, what are the reasons for the appalling mortality of 14·65 per cent. following operations for stone in the common duct? (This is the death-rate arrived at from a collective investigation into the subject made on behalf of the Association of Surgeons of Great Britain and Ireland recently.) Again, why should infection play such a prominent part in causing those deaths which may follow any kind of operation on the biliary passages?

What do we know about the ætiology of gall-stones? There are two predominating views—the infective and the metabolic. According to the first the gall-bladder is infected by one or other of several routes—the hæmatogenous being that most generally favoured. Following the cholecystitis so induced gall-stones develop. Those who uphold the second theory say that owing to some chemical upset biliary constituents separate out to form stones, and subsequently may or may not give rise to cholecystitis. It is important to get the ætiology right, otherwise we cannot expect to progress with preventive treatment; in other words, which is the cart and which the horse?

It is generally conceded that the single cholesterin stone has a metabolic origin; I think it is beginning to be agreed that the pigment and mulberry stones do not owe their origin as a rule to cholecystitis, and the combination stone, which appears as the result of infection, is in the first place a solitary cholesterin stone and therefore metabolic. It is held, however, that if all the cases in which a metabolic origin is conceded are subtracted from the total number of cases in which stones are found, there is a fairly large credit balance in favour of the multiple-faceted stones; this is supposed to make it evident that the commonest occurrence is for cholecystitis to antedate stone-formation.

THE INFECTIVE THEORY

A great impetus was given to the infective theory by E. C. Rosenow and later by A. L. Wilkie, of Montreal, from the experimental side. Briefly the results are these: Cultures were made from the cystic gland obtained from the human subject in cases of cholecystitis; the organisms grown were streptococci in 86 per cent. of the cases. Suspensions of these organisms were made of 250 millions to the cubic centimetre. About 2 c.cm. of the suspension were repeatedly injected into the veins of rabbits with the result that a progressive chronic cholecystitis was caused in most cases; if the cystic duct had been previously ligatured small calcium and cholesterin stones formed, or cholesterin stones only if the duct was left patent

These experiments appear rather convincing, but so far as I am aware they have not been substantiated further; moreover, the animals used were rabbits, which seem to be rather peculiar in that gall-stones can be produced in them by prolonged feeding with cholesterol—which, I believe, has never been accomplished in any other animal. Also I find it hard to believe these repeated massive injections reproduce human ætiological conditions. It is quite easy to understand they can cause cholecystitis; it is also possible to cause cholecystitis chemically by intravenous injections of Dakin's solution; but it is quite another thing to suggest human cholecystitis has a like origin to either method

I have again and again sent the human gall-bladder and cystic gland to be cultured after removal at operation, and only on the rarest occasions got a growth of streptococci; in a few cases, mostly acute, *Bacillus coli* have been grown, but for the most part the cultures have been negative, and this is the experience of many others who have interested themselves in this subject.

If it be granted for the moment that streptococcal infection occurs, where do the organisms come from? It is suggested they are set free from the teeth, tonsils, sinuses, appendix, and pelvic organs, to mention a few of the multiplicity of foci. If it is the pelvic organs we should expect married women to be relatively more often the victims of gall-stones than spinsters, and though this is generally believed to be the case, reliable statistics do not substantiate this belief, as D. M. B. Gross has shown. A. F. Hurst, too, has come to the conclusion that this is an incorrect statement.

As regards the other sites, the surgical and dental industry, which has been going on here for many years, has reduced the incidence of gall-stones not at all—which is rather odd if the premiss is correct.

CLINICAL EVIDENCE

Experimental work on animals may be suggestive, but it cannot be considered conclusive, at any rate so far, in its application to the human being, and as we are unable to repeat such experiments on the human subject we have to rely largely for our information on clinical (including operative) evidence. Unless notes are taken with the specific object of determining whether biliary colic or cholecystitis was the initial symptom they may not be very helpful, and, too, patients may be excused if they are rather hazy about events which happened maybe 20 years ago. Again, operative notes seldom give precise information as to the character of the stones found. But taking the notes for what they are worth in an analysis of 300 cases of operations on the gall-bladder and ducts, in which stones were present in 252, I found 106 began with violent pain and in 74 of these the attack appeared to be typical biliary colic. In 94 the patients com plained first of indigestion and in the other 100 the first symptom was not definitely expressed. In the 94 cases we are on rather uncertain ground, because though cholecystitis probably accounted for the first symptoms yet it is possible for stones to lie quiet until by impaction or constant fretting of the gall-bladder they promote inflammation. In the 100 indeter minate cases the proportional incidence was probably much the same as in the others. It seems fair to say, therefore, that in about half the cases stone almost certainly antedated infection of the gall-bladder. This receives support from my cases done in the last 18 months, in which the special points in the history have had more particular attention; in this series of 100 cases colic was the initial symptom in 45 and indigestion in 40; in 15 there was uncertainty.

The metabolic origin of gall-stones is emphasised further by other considerations; for example, the commonest operative finding in acute cases is a single cholesterin stone impacted in the neck of an acutely inflamed gall-bladder; in these cases it seems certain the gall-stone is the primary condition, and it is in the younger patients one finds this lesion most frequently. Moreover, it is quite common to find gall-stones when there has been no complaint of any trouble suggesting their presence, especially when operating for ovarian cysts or uterine fibroids. Again, they are found not infrequently post mortem when the clinical notes have given no indication of their presence. In 2731 autopsies at the General Infirmary at Leeds there were 20 per cent. with either gall-stones or strawberry gall-bladders in cases over 40 years of age; of these 211 showed liposis. I do not know the significance of the strawberry gall-bladder, but I am sure of this from my own experience, that organisms virtually never grow on the ordinary media when culturing is attempted from the gall-bladder wall; that flatulent indigestion of the type one associates with cholecystitis is a part of the clinical history; and that the symptoms clear up after cholecystectomy. There were 28 cases of strawberry gall-bladder in my last 141 cases of cholecystectomy and in 9 stones were also present. Lastly, I can recall 2 cases in which a pure cholesterin stone has been removed from the ampulla of Vater in association with faceted stones in a chronically inflamed gall-bladder; this suggests the possibility of a metabolic stone passing into the intestine leaving behind all the appearances of infection for which it was primarily responsible, and thus swelling fallaciously the statistics of the infective theory.

As to the nature of the metabolic disturbance, I have not the knowledge to discuss this properly; it is probably related to cholesterol and bile-salts in some way, that is to say a liver rather than a gall-bladder matter. Any theory, however, must explain at least two clinical facts—namely, the association of gall-stones with obesity and femininity. It is not easy to see how infection can do this.

THE HIGH MORTALITY

The question of the mortality, to which I have referred above, is a surgical affair, but not only, and in my opinion not chiefly, one of operative technique. No doubt technical skill in operations on the biliary tract has more to do with keeping down the mortality-rate than in most other parts of the body, but even so I believe getting the patient ready for operation is more important still. I should say that probably more than half of the 14·65 per cent. mortality quoted at the Association of Surgeons' meeting is due to inadequate preparation. My particular interest in this aspect of the subject covers a period in which I have done 150 gall-stone operations—114 cholecystectomies with 3 deaths (2·6 per cent.), 34 choledochotomies with 2 deaths (5·8 per cent.), and 2 cholecystotomies with 1 death; these figures are rather more than half what they were before this period. The essential points to observe are: first, to allow ample time for acute symptoms to subside whether these are inflammatory as in cases of cholecystitis or obstructive as indicated by jaundice—this may mean postponing operation for weeks; secondly, to employ the waiting time in repairing liver damage, kidney function, and less tangible injury for which dehydration is largely responsible. It is very seldom indeed that immediate operation is necessary in gall-stone surgery.

Anatomical abnormalities of the ducts and blood-vessels are very common in the biliary tract region; this, together with the embarrassingly difficult access at times, and the importance of the structures being dealt with, make gall-stone surgery the most technically difficult of all abdominal work, especially when pathological distortions are superimposed. Often as it has been said, it cannot be too frequently repeated that nothing should be divided until it has been identified; neglect of this fundamental rule is responsible for most of the operative catastrophes. There is another point which I think needs emphasising—it is in my experience impossible in something like 10 per cent. of cases to be sure by palpation alone whether or not there is a stone in the common duct. This is especially so where the head of the pancreas is hard and nodular as it not infrequently is in association with gall-stones. In 3 of my last 30 cases of choledochotomy I found a stone or stones in the common duct only after opening it; in each case I could feel no stone, but my suspicions were aroused by the size and texture of the duct and the nodularity of the pancreas. This opinion is supported by post-mortem records; during 6 years there were 33 autopsies at the Leeds General Infirmary on cases which had died after cholecystectomy, no operation having been done on the common duct, and in 6 there were stones found in the common duct presumably undiscovered and certainly left at operation. Again, in 7 of the 34 choledochotomy cases referred to above the gall-bladder had been removed at a previous operation, and this almost certainly means that the stone found on the second occasion had been overlooked at the first.

The relationship between infection-and mortality-rate is a very obvious one; in 75 post-mortem examinations of patients dying in the Leeds General Infirmary after operations on the biliary passages 27 showed generalising or gross local peritonitis and 17 broncho-pneumonia, which is more often than not a terminal manifestation of infection elsewhere. Most of these deaths, I think, are preventable by delaying operation until the acute stage is well over. The low resistance of fatty tissue to even minimal infection, combined with the large wound which has to be made and the amount of necessary manipulation, are sufficient reason in my opinion for inciting peritonitis and wound infection in gall-stone cases in the acute period, where a stone in the neck of the gall-bladder and acute inflammation of the organ are commonly found.

So far as the common duct cases are concerned there were in the same series 10 deaths due to infective cholangitis and hepatic damage. It is only seldom one is obliged to interfere surgically in the acute period of cholangitis, and it is fortunate that this is so, for many of these patients, from the surgical point of view, are the worst possible risks; if immediate operation should be deemed imperative it should be limited to drainage of the common duct (leaving the obstruction to be dealt with later) combined with blood transfusion and continuous intravenous saline and glucose.

So far as the administration of fluid is concerned I want to emphasise particularly the value of the intravenous method. I have had a considerable experience of this, and for those cases which really require fluid I am certain it has very great advantages over any other parenteral method; 50 pints can be given without trouble in 4 or 5 days and is for the most part retained, since there is no obvious sweating or proportionate increase in urinary excretion. Moreover, we know it is being added to the body fluids in the same quantities as given; this is by no means the case when the other methods are employed.

THE TOXÆMIAS OF PREGNANCY*

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II.—THE SIGNIFICANCE OF SYMPTOMS AND THEIR TREATMENT

General Outline of Treatment

No hard-and-fast rules for the treatment of toxæmia can be laid down, as its manifestations are varied in the case of each individual patient. In obstetrics, as in every other branch of medicine, experience teaches us that the patient is to be treated and not the disease. Prevention of toxæmia is obviously what we should more especially aim at now that the majority of cases of pregnancy are coming under early medical observation. With careful investigation and a knowledge of the normal, the slightest deviation from health will be taken as a danger signal and preventive measures employed in order to avoid complications. It is just this attention to detail and the supervision of the hygiene of pregnancy that is going to lower the maternal mortality of the country. Even now we can see the difference between the mortality in "booked" or supervised patients and those "emergency" patients who have had no antenatal care.

Careful attention in every patient to the condition of the teeth and skin, to the diet, and to the absence or presence of vomiting, hypertension, headache, and ocular symptoms, will go far in mitigating or eliminating the serious types of toxæmia such as acidosis and eclampsia. Sudden or fulminating attacks of toxæmia may occur especially in the later months of pregnancy. These cannot always be foreseen or prevented, but they are rare and in most cases when investigated will be found to be due to some gross error in diet. One must remember that pregnant women are not necessarily immune from any intercurrent pathological condition because of their pregnancy, although critics of our methods of antenatal care seem to demand from us a state of complete immunity for these women. Errors of diet have their consequences at any age and in either sex, but such errors have much more serious consequences if indulged in during pregnancy. The general treatment of toxæmia resolves itself into: (1) the careful avoidance by dieting of excessive or unsuitable food intake and the adoption of a diet which will make up for deficiences resulting from fœtal demands upon the maternal tissues; (2) the elimination of harmful substances by physiological rest and the suitable stimulation of those organs which are concerned with excretion. Right through the management of pregnancy and the treatment of toxæmia at any period these two principles must be our guide. We all differ as to details and put forth arguments in favour of some particular line of treatment which we fancy for the moment. Perhaps in no branch of medicine has fashion played such a part as in the treatment of the toxæmia of pregnancy. Drugs are excellent and in many cases necessary, but we shall do more by proper dieting and elimination than by any other means. Sedatives may be necessary but their employment is an indication of our ineptitude in stimulating physiological function. The less dependence we have on drugs and on interference with natural laws the more information will we be induced to seek in order to bring about a normal condition of affairs.

Diet

Much attention of late has been devoted to the importance of diet in the prevention and treatment of toxæmia, and we now find that our results are much improved as compared with those which we associated with the more or less indiscriminate administration of drugs. During pregnancy the diet should be as far as expedient that to which the patient has been accustomed. It ought to be of a plain mixed variety and should include a supply of green vegetables and fresh fruit. Preserved foods are deficient in vitamins, and are therefore less nourishing. Cereals contain a considerable quantity of calcium and other minerals. E. Mellanby, however, advises that their consumption should be "protected" by the addition of milk. In the case of well-nourished patients, butcher's meat and eggs should be taken sparingly, if at all, in the last three months of pregnancy, in order to relieve the strain of protein excretion; fish, chicken, and cheese are good substitutes. In addition it is found as a matter of experience that there is less rigidity of the fœtal head on a reduced protein diet and as a consequence labour is rendered easier. There is a popular fallacy that the pregnant woman must "eat for two." This creed has been the means in some cases of over-eating and toxæmia. Smaller meals at frequent intervals are advisable in cases of digestive embarrassment; fluids are necessary but should be restricted if there is a tendency to œdema of the tissues. A mixed carbohydrate diet with a supply of sugar will prevent the onset of acidosis. E. Mellanby makes the following suggestion for a diet in pregnancy: Milk 1–2 pints, green vegetables once or twice daily, 1 to 2 eggs daily, sea fish (for iodine content) twice weekly or more frequently. Calf's liver can be given once a week; the rest of the diet is to be within reason as the patient wishes. If deficient it should be supplemented with cod-liver oil 3 ii. daily. If on the other hand it is found necessary to limit food intake, the advice is often not welcomed by the patient as it means an irksome daily restriction. Bingham[1] advises ordinary light diet with a very moderate diet on alternate days only. This should consist of a cracker and glass of milk at three-hourly intervals, and I suggest the addition of two oranges. If attention is paid to limitation of quantity in the diet of mothers who are overweight or gaining excessive weight in pregnancy it will be found that in addition to the improvement in maternal welfare the fœtus derives a marked benefit. The child may be born below the average weight but it will have had an easier passage through the parturient canal and its postnatal loss in weight will be found to be less. Part of such loss in weight, which we find more marked in large infants, is now said to be due to reduction of excess of fluid in the tissues. Smaller and better babies are, therefore, to be desired, but we must exercise due care in this direction. Reduction in the expectant mother's weight can be brought about not only by dieting but by open-air exercise—two to three miles should be walked daily.

We are inclined to forget how dull and restricted the life of a woman is in the later weeks of pregnancy. She is cut off from most of her interests and is frequently very bored with life, whilst at the same time

* Second Ingleby lecture delivered in the University of Birmingham on May 3rd, 1934. The first lecture appeared in THE LANCET last week.

she has plenty of leisure to contemplate what the immediate future has in store for her. She is filled with fears about herself and anxieties about her baby. If we give her some interest in her food and make her take walking exercise up till almost the onset of labour we occupy her time and thoughts and accomplish much more than if we had only given her a prescription for the chemist. If her diet has been deficient and there is not time to make it up we may have to supplement with calcium, iodine, iron, and vitamins in the form of marmite, cod-liver oil, radiostoleum, and other preparations. My favourite prescription is 10 drops of concentrated radiostoleum in the juice of an orange once daily. If the patient is restless or sleepless or the fœtus is disturbing in its movements, she is probably deficient in calcium and this must be given. Calcium will also relieve the muscular cramp of pregnancy. One-grain doses of thyroid extract are beneficial in some of the skin affections of pregnancy, at the same time attention being given to dieting and the avoidance of excessive protein intake. Excessive purgation is a mistaken means of assisting elimination. Constipation is associated with vitamin and endocrine deficiency and should be treated on rational lines. One of the mild forms of purgation for pregnant women is a glass of warm water mixed with an infusion of senna pods to be taken early in the morning before breakfast.

One cannot leave the subject of diet without reference to the care of the teeth. Pyorrhœa is a sign of vitamin deficiency. Caries is predisposed to by vitamin and calcium drain. Mrs. Mellanby's [28] work on this subject is well known. Every pregnant patient should be treated by a dentist if there is evidence of caries at all, even if only in one tooth. Oral sepsis is a predisposing cause of throat affections, toxæmia, and puerperal sepsis, and also of inability to suckling. Extractions do not produce abortions by any means, and in antenatal care dental treatment is one of the most valuable aids we possess. A condition of admission to the wards in the Royal Free Hospital for confinement is that consent should be given for dental treatment during pregnancy.

Significance and Treatment of the Symptoms and Signs of Toxæmia

Vomiting is perhaps one of the most frequent and important symptoms of toxæmia. It may occur at any period of pregnancy. It also occurs during labour in some cases, but is rarely observed in the puerperium. It may vary in intensity from the mild vomiting or morning sickness of pregnancy to the profound vomiting which is the result of toxæmia of both hepatic and renal origin. It is of more frequent occurrence in the first three months of pregnancy than in the latter months.

MORNING SICKNESS

In the examination of 100 consecutive antenatal cases in the Royal Free Hospital which were more or less normal, morning sickness had occurred in 50 per cent. In 14 out of 30 cases of eclampsia morning sickness was absent. In eight cases (four of which died) it was slight. I need not dwell upon the theories in regard to the causation of morning sickness. It is quite possible that acidosis may be closely associated with the symptom. The treatment, therefore, is to have a supply of barley sugar at the bedside and for the patient to eat the sugar in the early morning and also drink a glass of warm water. Attention to the functions of the intestine is desirable, but the indiscriminate administration of purgatives is to be condemned. The diet should be regulated in order to supply the vitamins which are necessary for normal metabolic function.

VOMITING IN EARLY PREGNANCY

This when frequent or prolonged usually denotes a condition of carbohydrate deficiency associated with an anxiety neurosis. Hyperemesis gravidarum should not be classified as a disease; it is a symptom of severe toxæmia, occurring early in pregnancy and is a very rare condition. Persistent vomiting when present in earlier pregnancy is proved by treatment to be due, in the majority of cases, to an anxiety neurosis. When patients suffering from worry and domestic anxieties are admitted to hospital or a nursing-home the vomiting soon ceases. It is a true "home sickness." Treatment carried out in hospital to some extent results in failure if the patient is kept in her home surroundings. I have not infrequently seen examples of a patient reacting quickly to treatment in hospital who, when sent home, had a recurrence of the symptoms, which again vanished on readmission to hospital. Investigation of all cases of vomiting should be thorough in order to ascertain if hepatic or renal damage is present. The persistent vomiting of pregnancy in a multipara not infrequently suggests renal damage. In a primigravida it is more likely to be early and hepatic in origin. The routine treatment is rest in bed, absolute freedom from worry, and adverse physical sensory and mental stimuli. For the first 24 or 48 hours the patient is kept on water with glucose and fruit juice. If the vomiting persists, washing out of the stomach combined with the administration of glucose solution per rectum is helpful in some cases. As soon as possible small carbohydrate meals should be given, beginning with dry biscuits, fresh butter, and barley sugar. This is to be followed by light mixed diet with limited protein. Sedatives may be necessary if the patient is worn out and sleepless. Calcium should be given either intramuscularly as calcium gluconate, or as calcium sodium lactate. The combination of calcium, potassium citrate, and bicarbonate of soda in a tumbler of water, as advised by Cameron,[29] is effective if the vomiting is not severe. In more severe cases no food or fluid should be given by the mouth. Fluids administered per rectum containing glucose and bicarbonate of soda are essential in order to avoid the dehydration which is likely to take place. Vomiting may start as a neurosis and cause acidosis from starvation. This in its turn keeps up the vomiting. The urine should be examined for albumin and the ocular fundi for retinal changes and the blood pressure taken for hypertension. If there is a positive result and the signs of toxæmia are present in a marked degree it will be necessary to empty the uterus, a procedure, however, which is rarely required.

HYPEREMESIS GRAVIDARUM

In this type of vomiting the toxæmia is profound and progressive. There is rapid dehydration of the tissues and not infrequently emaciation and jaundice are present. The blood pressure may be low, in which case the ovum should be removed without delay. No laboratory tests are required to inform us that such a patient is very seriously ill. Munro Kerr [3] points out that when vomiting ceases in severe cases the possibility of paralysis of the cerebral centre has to be considered, a fatal ending being not far distant. I have not seen one case of this type of severe vomiting in the last ten years, although a very large number of cases of vomiting are admitted to the wards for treatment. A considerable degree of success in carrying out treatment depends upon

the assurance given to the patient that she has nothing to fear and that she will get well. Theobald [26] is opposed to the fact that vomiting is due in most cases to an anxiety neurosis, but there is no doubt that isolation and freedom from worry has a remarkable effect in bringing about a cure in the majority of cases; without this psychic adjunct dieting alone would be ineffectual. Fyfe Anderson [27] points out that vomiting is sometimes an evidence of pyelitis, and that the colon bacillus should be sought for in the urine.

In some cases vomiting in pregnancy may be due to gastro-intestinal conditions unconnected with pregnancy. Treatment on the usual lines for digestive trouble—viz., by bismuth subnitrate, lactopeptone combined with bicarbonate of soda—is of benefit and may cure the condition. Colon lavage is always useful in the treatment of vomiting.

HEARTBURN

This is sometimes a sign of grave impending toxæmia. I have found good results from advising small dry meals with low fat content. Fluids should be given between meals. This gives the gastric juices an opportunity to act. Dilute hydrochloric acid in 15-30 drop doses during meals gives relief in cases where hypo-acidity is present. Fyfe Anderson and Brian Rayner [28] have written on this subject.

HEADACHE

This if persistent may be due to anxiety, hypertension, eyestrain, or intracranial tension, and should never be overlooked. It is sometimes the first danger signal of the onset of eclamptic convulsions. Rest in bed is necessary in some cases and careful dieting of the carbohydrate type. If it is very severe lumbar puncture may give relief. Calcium lactate or calcium gluconate have also been given with good result. Pain on the whole is a rare symptom in pregnancy. It is present in severe forms of toxæmia in the region of the epigastrium and is due to tension under the liver capsule owing to small hæmorrhages. General treatment brings relief.

HYPERTENSION

This is frequently present and in toxæmia of the renal type may be persistent in spite of treatment. It may or may not be present in hepatic toxæmia, but in some of these cases the blood-pressure readings are found to be abnormally high. As a rule it reacts quickly to treatment. In persistent hypertension cardiovascular complications are present and cerebral hæmorrhage may occur. Hypertension if it does not yield to treatment is an indication for termination of the pregnancy; it is associated frequently with albumin and other signs of toxæmia, and in severe cases the blood pressure may fall rapidly. I have seen this occur before death in eclampsia as the result of heart failure. I have always been rather afraid of the rapid reduction of blood pressure by drugs such as veratrone, as there is danger of heart failure. Hypertension must have some protective function although we look upon it as an indication that the patient's condition is serious. In cases of toxæmia with high blood pressure I have been against excessive fluid administration intravenously or otherwise. I feel sure that blood volume increased in this way tends to aggravate the condition. Venesection, therefore, has an important place in the treatment of these cases.

Osman [17] points out the significance of essential hypertension in the follow-up of cases of toxæmia of pregnancy, and thinks that it might be a symptom in itself, and that it does not always indicate kidney damage. He refers to Cushing's statement that hypertension in eclampsia and also essential hypertension suggests an increase in the function of the posterior lobe of the pituitary.

Œdema is usually accepted as a sign of renal damage, but we have already seen in the previous lecture that in its association with increase of weight it is due in some instances to excessive food and fluid intake, in particular of sodium chloride. Rest in bed, regulation of the diet, and general treatment especially with small doses of magnesium sulphate will have a beneficial effect. Restriction of fluids also has a marked effect when balanced equally with the urine output. In œdema due to cardiovascular changes the treatment should be on ordinary medical lines.

OCULAR DISTURBANCES

In cases of severe or prolonged toxæmia, especially of the renal type, the ocular fundus should be examined by a specialist. The presence of hæmorrhages, separation of the retina, or of retinitis is a valuable indication for the termination of pregnancy. Ocular changes are much more frequent in nephritis toxæmia, although blindness may be more frequent in the hepatic type. As a rule the ocular symptoms disappear after the termination of the pregnancy in hepatic toxæmia but not to the same extent in kidney lesions. In 30 cases of eclampsia in the Royal Free Hospital only 3 had ocular symptoms. Only one patient was found to be affected out of 65 cases of severe toxæmia without convulsions. In the renal type ophthalmoscopic examination may reveal a very serious condition of affairs which may shorten life within some few months or years of the pregnancy.

ANÆMIA

In hospital practice one is frequently struck with the large number of anæmic women who attend the clinics or come into the wards. Although in this country we have not the profound anæmias which are described by Lucy Wills [21] and also by Green-Armytage [22] as occurring in India, there is a considerable amount of fairly serious anæmia in association with pregnancy. This anæmia is mainly due to vitamin and iron deficiency. Sunlight, fresh air, and a generous mixed diet is essential in the prevention and treatment. Green vegetables such as spinach contain iron. As already mentioned, the fœtal drain on the maternal iron is considerable.

In the antenatal clinics of the hospital we give yeast and massive doses of ammoniated citrate of iron in powder form to a large number of the patients. In the wards each patient receives once a day a routine dose of iron and cod-liver oil. Marmite and cooked liver or liver extract are given to some of our anæmic patients. Our biochemists, Dr. Pillman Williams [24] and Dr. Lucy Wills, investigate and superintend the treatment of this condition. I sometimes question how much absorption takes place in those cases in which massive doses such as 90 grains of Blaud's pills are given daily. Transfusion of blood, as most obstetricians know, is of great benefit in the treatment of severe anæmia, toxæmia, shock, and sepsis.

ANTEPARTUM HÆMORRHAGE

In hæmorrhage occurring most especially in the later weeks of pregnancy and apart from that due to placenta prævia the chief cause is toxæmia, which results in placental changes and separation from the uterine wall. Fœtal death is inevitable if the hæmorrhage is extensive. In my experience this condition has decreased very much of late—a fact which is a

testimonial to antenatal supervision. If the placenta has not entirely separated the effect of the toxæmia on the mother is much more marked than when the placenta is free in the uterus. This points to the fœtal and placental origin of the toxæmia, but this condition may be secondary to the deficiency disease of the mother.

In the treatment of antepartum hæmorrhage all depends upon the conditions which determine whether simple rupture of the membranes or Cæsarean hysterectomy is indicated. The more severe the condition the less should be the surgical interference, as the hæmorrhage may be a symptom of a very profound toxæmia involving the liver and kidneys. It must also be remembered that version of the fœtus in breech positions may be followed by hæmorrhage in a toxic patient. I cannot too strongly stress the fact that in my opinion version is a serious operation and should not be undertaken lightly in cases of toxæmia. It not infrequently leads to fœtal death and sometimes to partial separation of the placenta.

In the investigation of 40 consecutive cases of toxic antepartum hæmorrhage in the Royal Free Hospital we found that it occurred more frequently in multiparæ, thus pointing to a renal origin of the condition. The fœtal mortality was high—25 per cent. No maternal deaths occurred, and Cæsarean section was not performed in any of the cases. Only 12 of the cases were near or at term; the earliest case was at the 30th week.

Postpartum hæmorrhage is due in the majority of cases to toxæmia and fatigue and can often be avoided by feeding the patient with light meals during labour and encouraging her to eat barley sugar. Abstaining from touching the uterus during the third stage of labour except when expelling the placenta prevents postpartum hæmorrhage in many cases.

INVESTIGATIONS OF BLOOD AND URINE

In mentioning the assistance we obtain for purposes of diagnosis in the investigation of the blood and urine of a case of toxæmia, I have not the courage to enter into any discussion in regard to the respective merits of the tests which the various biochemists put forward. I agree with Dr. Bethel Solomons [10] that a test is of little value to our limited intelligence as clinicians unless it can be put to some use at the bedside. What does it all narrow down to in the end?

The examination of the blood indicates not only the number of blood corpuscles and percentage of hæmoglobin, but in addition gives us some insight into the function of the kidneys by furnishing a report upon the urea content. This content is normally lowered in pregnancy, especially in the latter half. If the urea content soars to 30 or 40 mg. per cent. we feel there is some cause for watchfulness at least.

In a normal pregnancy a urea content of 22, or slightly over, reassures us that renal function need not be a source of anxiety. If the urea content indicates renal complications we try treatment by rest in bed and dieting, but if this fails the pregnancy may have to be terminated. Uric acid is, however, a finer test of nitrogen retention than urea. The sugar curve of the blood is an indication of the aberrations which take place in carbohydrate metabolism. In cases in which the blood-sugar content is high, insulin may be given with discretion.

Examination of the urine.—Albumin is the danger flag throughout pregnancy. When it persists and is considerable in quantity it indicates renal damage and should never be overlooked. Hence the routine examination of the urine in all cases of pregnancy is a necessity. A considerable amount of albumin in the urine should not be allowed to persist for more than two to three weeks as there is the danger of permanent kidney damage. It is an indication for the termination of the pregnancy (Gibberd [11]).

In regard to the feeding of patients suffering from considerable loss of albumin due to chronic nephritis, there is some diversity of opinion. If the protein loss is excessive the tissues will be drained. In the case of a pregnant patient suffering from this condition there is the added drain from her fœtus. She will, therefore, suffer from protein starvation unless her intake is supplemented by protein. Physicians not infrequently find that patients suffering from nephritis show signs of rapid improvement when a protein diet is provided. The whole question is admirably discussed by Cruickshank.[8] I have found for years that it is desirable to get a patient, suffering from toxæmia, on to a mixed diet as soon as possible. I have had much better results than when I adhered to the rigid rules which practically meant starvation.

The urea-concentration test is useful in determining renal function. The presence of casts is also of value. Bacteriological examination for the colon bacillus by culture of the urine at the bedside as advised by Colebrook [39] I find gives many more positive results than those obtained when the urine, after standing, is sent to the laboratory for culture. An important indication of renal damage is the low specific gravity of the urine. The quantity of urine passed is very important, especially in serious cases of toxæmia. The intake and output of fluid should be carefully measured and compared. Scanty or suppressed urine is a grave sign of toxæmia and may indicate immediate efforts for the termination of the pregnancy. In renal cases suppression is even more serious as it indicates a greater degree of concentration than toxæmia. I have no experience of decapsulation of the kidneys or other similar operations. I see little indication for them but rather the danger from surgical interference in these cases. Hot packs, electric light baths, and diuretics such as citrate of potash are of benefit. Urea may be used with care. Cruickshank advises guaiacum baths—painting the axilla with tincture of guaiacum 10 per cent. in glycerin and applying warm blankets for 20 minutes. Pyelitis rarely requires treatment other than rest in bed, dieting, warmth, and urinary sedatives and antiseptics. A very large number of these cases are sent into our wards for treatment, and in no case has surgical interference been necessary; as a rule, these patients clear up very satisfactorily, and a ketogenic diet is giving good results in some cases. In the study of the blood and urine changes the biochemists give us many tests and deductions which may persist or may change with the fashions. We go on our way thankful for any help in making a diagnosis, but we rely to a great extent upon our own clinical observations and our knowledge of the particular patient concerned.

ECLAMPSIA

This is the most serious form of all toxæmias. It would take a volume to contain the information we are given on the subject. We all treat it by methods of elimination and by sedatives in all their permutations and combinations, but we must remember that the prevention is our aim. Prof. Stroganoff came to London from Russia some years ago to show us how to treat eclampsia and asked us all to give him cases for demonstration. When he visited the Royal Free Hospital I told him we had none at the time and that our practical experience of these cases was getting less and less. He said to me: "I have

come to London to teach you all the treatment of eclampsia, but I am returning to Russia having learned how to prevent it."

Indications for Surgical Treatment

Statistics everywhere seem to be in agreement that the less we interfere with these cases of toxæmia the better, and that the lowest mortality is obtained by conservative methods, but when obstetrical indications require the application of forceps there is, of course, no ban upon their use. Pregnancy in some cases has to be terminated early in order to save the life of the mother or guard her from permanent ill-health. Termination in late pregnancy may be necessary for the same reasons and also perhaps to save the life of the infant.

A list of cases where the induction of therapeutic abortion has taken place in the Obstetrical Unit at the Royal Free Hospital shows the total number in 10 years (1921–31) to have been 52, classified as follows: pulmonary tuberculosis, 25; heart disease, 14; renal disease, 8; miscellaneous, 5. In no case was the uterus emptied because of uncontrollable vomiting.

The best method of terminating an early pregnancy is by hysterotomy which can be combined with sterilisation. The rapid evacuation of the uterus by the cervical canal is dangerous, except in very early pregnancy owing to hæmorrhage and shock. The slow method by tents or a small rubber bag gives better results. Premature labour can be induced by digital stretching of the cervix and by separation of the membranes at the internal os. Rupture of the membranes, or the introduction of a rubber tube or bag, are also to be advised.

There are no rules to be followed except those which are gained by our own experience. A case of nephritis may require induction of abortion or, preferably, abdominal hysterotomy and sterilisation. In some cases we allow the pregnancy to continue, and urge that it must be the last; this is a risky proceeding and requires great supervision, but the results in the chosen cases have been very satisfactory. If the patient has symptoms which do not react to efficient treatment, or the condition is grave and yet not grave enough for the risk of interference, then we confess that we have failed as physicians and must perforce recommend surgical interference. But my rule as in all cases of operations in obstetrics is "when in doubt do nothing." We must remember that many women's lives are just saved because we manage to avoid the strain and perhaps trauma of labour until the condition of toxæmia has been improved with treatment.

Cæsarean section has its place for consideration. It is advocated by Miss Basden,[21] who has obtained good results. I have found few indications for its use and avoid it in the treatment of acute toxæmia except in cases where there is a definite obstetrical indication. For example, in our treatment of 65 consecutive cases of grave toxæmia Cæsarean section was not performed in a single case, and there was not a maternal death.

ANÆSTHETICS

These require careful consideration in cases of toxæmia. Gas-and-oxygen is safe; chloroform is a hepatic poison; ether may cause pulmonary complications. If spinal anæsthesia is employed due attention must be given to the state of the blood pressure. If low, spinal anæsthesia is contra-indicated. I would like to give a warning as to the use of pituitrin injections in cases of toxæmia, especially those of renal origin. I have had a case of death from sudden shock and uræmia just after an easy spontaneous delivery in a multipara with renal damage. This occurred after the administration of pituitrin. In several other cases I have noticed the presence of varying degrees of shock after pituitrin injections. It is a method of treatment which cannot be used without considerable discrimination.

Postnatal and Antenatal Care

It is obvious from a study of toxæmia and its effect upon maternal morbidity that a thorough examination should be carried out in every case a few weeks after childbirth and the puerperium. If any complication is found to be present, further supervision and treatment are indicated. The investigations upon renal function show how necessary it is that this function should be tested. For this reason postnatal care is essential for every individual patient no matter how normal her confinement may have been. Every case attended by a midwife should be seen later by a doctor at least once; gynæcological complications would be reduced to a great extent by this means. In some cases it is necessary to forbid any future pregnancy or one before a given date, and for this reason contraceptive advice should be available at the postnatal clinic just as part of the general medical supervision. Separate clinics would not be necessary if every practitioner had a knowledge of contraceptive treatment.

The chief aim of antenatal care is to prevent the development of toxæmia or if it has developed to prevent the onset of serious symptoms such as acidosis or eclamptic convulsions. Most of the toxæmias of pregnancy can be prevented by a suitable mixed diet. Treatment of the condition becomes most effective when diet deficiencies are supplemented. Drugs may have to be given to replace more rapidly the tissue drain.

The Standard of Obstetric Work

In conclusion I would urge that the standard of obstetric work and teaching must be raised throughout the country. Clinics must be staffed by medical practitioners who have had special training in the work but who are not necessarily specialists. These should preferably be responsible for the supervision of the whole management of pregnancy, labour, and the postnatal maternal welfare. The Diploma of the College of Obstetricians and Gynæcologists or that of the Society of Apothecaries or other equivalents should be insisted upon by public health authorities as a qualification for undertaking the duties of an antenatal clinic. Antenatal work should be in the hands of qualified practitioners. Midwives should carry out the instructions of the doctor and should have facilities for immediate help when it is required in childbirth. A panel of practitioners should be available for this purpose and consultants referred to when necessary.

Much criticism is levelled against antenatal supervision, but in reply one has only to compare the midwifery of the present day with that before antenatal examinations came into practice. Craniotomy operations upon the living fœtus are now almost unknown and yet the Cæsarean section-rate has not increased in those clinics where antenatal care has been made a special feature. Accidental hæmorrhage and difficulties with malpresentations are rarely encountered now in the labour ward. In time also we shall gain much more knowledge of the prevention of eclampsia.

The physician who by research and practice lowers the incidence of general diseases such as rickets, scarlet fever, and rheumatism, will do much to

aid us in the reduction in the maternal mortality of future generations.

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ASSOCIATION BETWEEN NEUROSYPHILIS AND CARDIOVASCULAR SYPHILIS *

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WHEN I first entered mental hospital work I had expected to find cases of general paralysis of the insane exhibiting no cardiovascular lesions. I was thinking along the old lines that cardiovascular lesions were but tertiary manifestations and due to renewed activity of the spirochæte; whereas general paralytic changes were to be regarded as something entirely different, not due to direct spirochætal activity, and in fact parasyphilitic.

Collier, in arguing against the theory of two varieties of spirochæte, neurotropic and dermotropic, points out that it can no longer be held that tabetics and paretics are free from tertiary lesions. The clinical work to be reviewed brings all the different syphilitic manifestations into line with each other, and demonstrates the absurdity of the theory of two varieties of spirochæte. From a study of the work of Warthin, it seems only rational to expect to find cardiovascular changes in a large proportion of cases showing neurosyphilis. There are people who have weak cardiovascular systems, and who show arterio-sclerotic brain changes in association with heart lesions. When they get syphilitic infection (which we now know to be a widespread infection) they will be the people to show markedly this association between neurosyphilis and cardio-aortitis.

CLINICAL EVIDENCE

In 1930 Bach and Worster-Drought examined 25 clinical cases of neurosyphilis for cardiovascular changes, and 25 clinical cases of cardiovascular syphilis for neurosyphilis. Of 25 cases of neurosyphilis, 7 (28 per cent.) showed cardiovascular changes. Of 25 cases of cardio-aortitis, 4 (16 per cent.) showed some neurosyphilitic changes. Carey Coombs in the same year found that of 103 cases of cardiovascular disease due to syphilis, 26 (25 per cent.) gave evidence of neurosyphilis.

In 1907 Rogge and Müller of Breslau in 22 consecutive cases of tabes dorsalis found 8 (36 per cent.) with definite clinical evidence of syphilitic cardiovascular disease. In 1913 Denke reported on 153 cases of syphilitic aortitis, of which 63 (41 per cent.) showed physical signs of neurosyphilis. In 1923 Frisch published a series of 115 cases of neurosyphilis, of which 9 only (7 per cent.) showed clinical evidence of aneurysm or syphilitic aortitis.

Thus clinically one in seven of neurosyphilitics give evidence of cardiosyphilis. Viewing the relationship from the other standpoint, there is in cardiosyphilis a great variation in the percentage showing neurosyphilis:—

Bach and Worster-Drought	..	16 per cent.
Coombs	..	25 ,,
Denke	..	41 ,,
Average percentage	..	33 ,,

Thus, clinically, one in three of cardiosyphilitics give evidence of neurosyphilis.

PATHOLOGICAL EVIDENCE

Frisch, in 1923, in 115 cases of neurosyphilis found pathological evidence of syphilitic aortitis in 45 cases (39 per cent.), Kessler, in 1924, in 59 cases of tabes dorsalis found 39 cases with syphilitic mesaortitis (66 per cent.), Lowenberg in 341 cases of general paralysis found 114 cases with evidence of aortitis at autopsy (33 per cent.). This gives an average percentage of 38 and thus from the pathological evidence more than one in three of neurosyphilitics give evidence of vascular changes.

The difference between the clinical and pathological figures is accounted for in several ways. First, it is difficult to detect the cardiac lesions in life with ordinary methods of examination. These patients do not complain of any cardiac symptoms, and only recently have the newer methods of radiography and electrocardiography been applied to this work. Secondly, the neurosyphilitics are the class with the nervous system more vulnerable than the vascular system. Thirdly, when cases come to autopsy, both nervous and cardiac lesions will be well advanced.

AN INVESTIGATION

I will now give the results of an inquiry into 169 cases (seen at the County Mental Hospital, Chester) which were analysed for the correlations between neurosyphilis and cardiovascular syphilis. These cases, like those given above, have been divided into two groups, the clinical and the pathological.

Clinical evidence.—There are 114 cases in this group, subdivided into the following sections:—

(*a*) Cases discharged after malarial treatment	..	40
(*b*) Cases remaining in hospital at end of 1931	..	33
(*c*) Cases dying in the years 1925 to 1931, but where no post-mortem examination was held	..	41

The clinical evidence in these cases is derived from auscultatory findings, blood-pressure records, and radiographic examination. In each case by inspection and palpation an estimate is made of the size of the heart, particularly for left ventricle hypertrophy or dilatation. The aortic sounds are carefully examined. A systolic aortic murmur, loudest at the aortic area and propagated up into the vessels of the neck, is taken as evidence of aortic stenosis. The murmur is usually loud and rough, and often accompanied by an aortic systolic thrill. A diastolic murmur, soft and blowing, transmitted down the left of the sternum, especially if associated with left ventricle enlargement and Corrigan's pulse, is taken as evidence of aortic incompetence. The most common finding is a basal aortic systolic murmur, and an accentuated aortic second sound. Many cases gave the characteristic basal to-and-fro systolic-diastolic murmur.

The blood pressure has been taken in all cases with a baumanometer, in the lying-down position, between 11 A.M. and 12 noon. Both pulses are examined, and in many cases a marked difference has been found between the readings on the two sides. A raised blood pressure with an accentuated aortic second sound in a young man with a positive blood Wassermann is taken as evidence of early syphilitic aortitis.

* Part of a thesis for the M.D. degree of the University of Birmingham.

The chest has been screened in most of the cases, and the more interesting cases have been plated. The signs looked for are: slight enlargement of the heart to the left, increase of the aortic shadow to the right, dilatation of the aorta, enlargement of the aortic knuckle, and in some cases obvious aneurysmal dilatation. In assessing each case the findings of the three special methods of examination are carefully considered, and so an accurate picture is obtained of the cardio-aortic state.

Of the cases discharged after malarial treatment, 32 are Chester cases, the other 8 are cases sent from Denbigh Mental Hospital for malarial treatment.

TABLE I.—*Incidence of Cardiovascular Syphilis in cases treated by Malaria*

	G.P.I. cases.	Cardiosyphilis present.
1925	8	4
1926	2	1
1927	4	1
1928	1	0
1929	4	1
1930	3	3
1931	10	6
Denbigh.....	8	4
	40	20

In this series 50 per cent. of the cases of general paralysis give evidence of cardiovascular syphilis.

TABLE II.—*Cases remaining in the Hospital at the End of 1931*

Admitted.	G.P.I. cases.	Cardiosyphilis present.
1919	1	1
1925	1	0
1926	1	1
1927	6	5
1928	4	3
1929	6	4
1930	2	1
1931	12	6
	33	21

In this series 64 per cent. of the cases of general paralysis give evidence of cardiovascular syphilis.

TABLE III.—*Cases Dying 1925 to 1931, no Post-mortem Examination being Held*

	G.P.I. cases.	Cardiosyphilis present.
1925	8	6
1926	9	2
1927	8	8
1928	8	4
1929	3	3 (1 case of aneurysm)
1930	1	1
1931	4	3
	41	27

In this series 66 per cent. of the cases of general paralysis give evidence of cardiovascular syphilis.

From three groups of cases set out in Tables I.–III. it is seen that 59 per cent. of the general paralytics at Chester give clinical evidence of cardiovascular syphilis. This figure is much higher than any figures yet published. It shows that it is the rule, rather than the exception, for a well-marked case of general paralysis to show evidence of cardiovascular damage.

Pathological evidence.—There are 54 cases in this group of general paralytics, dying in the years 1925 to 1931. In each case a post-mortem examination was held, the heart and great vessels were carefully examined for evidence of syphilitic valvular disease and syphilitic mesaortitis respectively. Sections of the diseased aorta have been examined microscopically in doubtful cases, and in many the spirochæte has been demonstrated. In some cases it has been difficult to decide between senile atheroma and syphilitic aortitis. These doubtful cases have been rejected. Coombs, in his Lumleian lectures in 1930, discussed this difficulty, and his criterions have been adopted.

TABLE IV.—*Autopsies showing Cardiovascular Syphilis*

	G.P.I. cases.	Cases showing cardiosyphilis.
1925	3	2
1926	10	4
1927	8	7
1928	6	5
1929	7	7 (2 cases of aneurysm)
1930	14	10 (2 cases of aneurysm)
1931	6	5
	54	40

In this series 74 per cent. of the cases of general paralysis give evidence of cardiovascular syphilis.

The 40 cases showing cardiovascular syphilis were distributed in age-groups as follows:—

Ages—	*28*	*30–34*	*35–40*	*41–44*	*45–50*	*51–54*	*56*	*62*	*68*
	1	3	4	13	10	6	1	1	1

Thus the biggest proportion of these cases fall into the 40–50 group, that is the fifth decade. It is to be noted that 8 cases occur in men under 40, this being contrary to Kessler's findings. Five cases showed a partial Babinski syndrome, being cases of tabes dorsalis with aortic valvular disease and aortitis.

PREVIOUS TREATMENT

I have made inquiries into the previous treatment, the date of infection, and the latent period. There were three cases where no history was obtainable. Two cases had received no treatment at all, but the latent period was estimated as 5 years and 20 years respectively. Seven cases gave a history of previous mercurial treatment only, and in these cases the latent periods were 12, 14, two at 18, 19, 20, and 30 years respectively. Twenty-eight cases had received early treatment with arsenobenzols. Most of these had acquired their infection during war service and had received one or two courses of "606" but did not persist in treatment. This group of cases is extremely important in connexion with the question of the efficacy of arsenobenzol treatment and the questionnaire sent round by the Medical Society for the Study of Venereal Diseases in 1925 (see Brit. Jour. Ven. Dis., 1925, i., 133). The latent periods of this group of 28 cases are as follows:—

Years—	*4*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*20*
	1	1	1	1	3	6	7	3	2	1	1	1

It is to be noted in this group that more than half of the cases have a latent period of 9 to 12 years, whereas in the group having had mercurial treatment the shortest latent period is 12 years. It thus seems that a short course of "606" predisposes to early and intense nervous and cardiac lesions. The two cases with 20-year and 15-year latent periods had received prolonged "606" treatment in America. Apparently the most dangerous treatment of early syphilis is a short course of "606," giving as it does great security at that time but intense morbidity in the space of 9 to 12 years.

DISCUSSION

The figures obtained in the series of cases examined at the Chester Mental Hospital show a much higher percentage of cardiovascular syphilis in cases of neurosyphilis than any yet published. They are higher even than those of the German clinics. It must be remembered that the cases of general paralysis sent to a mental hospital are very advanced in their disease, and hence such a close correlation between neurosyphilis and cardiosyphilis is to be expected. The general conclusion to be drawn is that syphilis affects the whole body more commonly than is supposed; it supports the contention of Warthin that spirochætes will be found in every organ of the body in a syphilitic. It also supports the view that general paralysis is an active syphilitic infection, and not a parasyphilitic process.

The incidence of cardiovascular syphilis in association with neurosyphilis and mental disease is of immense importance from the point of view of treatment by induced malaria. In the early years of this treatment many cases died suddenly during or just after their pyrexial course, and no clinical evidence of aortic disease had been found. I have seen such cases at the Chester Mental Hospital, and similar findings have been noted by Bach and Worster-Drought, Gerstmann, Rudolf, and Lowenberg. The correlation between the two kinds of syphilitic disease, cardiac and nervous, is really closer than had been thought. It was taught that the clinical diagnosis of the nervous lesions was predominantly in the fourth decade and that of the cardiac lesions in the fifth decade, but in mental hospital work the two kinds of disease occur together in the fourth and fifth decades. Which lesion will be noted first depends partly on the severity of the separate lesions and also on the relative sensitivity of the two systems in the one individual. Thus the make-up of the patient from both the physical and mental angles determines this issue. Ernest Jones has demonstrated that certain people have undue sensitivity of their internal organs, and if this state is very well marked, hypochondriacal symptoms will result. These psychasthenic people, when infected with syphilis, complain of the lesions according to the more sensitive system, and thus the diagnosis is determined to a cardiac or a nervous state. In general one would expect an earlier outcry on the part of the nervous system, as it shows a more sensitive reaction to disease.

With reference to the age of incidence of the two types of disease, and the period after initial infection, there are some differences of opinion. Kessler said in 1924 that cases of neurosyphilis under 40 years of age did not show aortic disease. I have referred to eight cases showing well-marked aortic disease with neurosyphilis under the age of 40 years. Stokes stated that it was rare to find the cardiovascular system affected by syphilis in the first decade after initial infection, that only 45 per cent. were diagnosed in the second decade, and that 55 per cent. occur in the third decade or later. In my series I have found cases of fulminating general paralysis with pronounced cardiovascular changes within a decade of the initial infection. This is an important point when discussing the early treatment of syphilis, as it is certain that the service men who had short courses of arsenobenzol treatment relapsed sooner than men infected in the early years of this century and treated with long courses of mercury. Coombs found the latent period in his series of cardiac cases to be 22·7 years, and Bruce found it to be 25 years. In my series I have differentiated between the cases having arsenobenzol and mercurial treatment, showing that the latent period averages about ten years with the former and twenty years with the latter. It is surely no accident that there is so close an association between the two sets of syphilitic phenomena, the cardiac and the nervous. The disease must have evolved in the same way in the two areas, and the only differences noted will be differences of function, depending on the relative weaknesses of the two systems in the individual concerned. Males predominate in all the series of cases published either of nervous or cardiac disease, Coombs showing that 90 per cent. of his cases were males. Again, even in congenital syphilitic disease the heart and the brain lesions fall into the same epoch, but the latent period is a little shorter.

It now remains to inquire if there is any fundamental explanation of this very close association between the cardiac and the nervous lesions. Warthin's paper on the lesions of latent syphilis shows that, once a person is infected with the spirochæte, foci of latent infection remain in all the organs for the rest of the patient's life. Thus it is not really surprising that, when activity is renewed, disease arises in both heart and brain; the wonder is that many other organs are not acutely affected in addition. There is, however, evidence that other organs do show active disease at a late stage, and in association with nervous and cardiac lesions. Bruce found diabetes mellitus, presumably of syphilitic origin, to be a frequent accompaniment of syphilitic disease of the circulatory organs. Marañon saw it 23 times in 140 cases of aortic syphilis. On the other hand, Coombs had not seen one such case. Bostock described a case in 1926, and I have in my series a very interesting case beginning as diabetes, then suffering from aneurysm, and finally dying of specific meningo-encephalitis, the spirochæte being found in all three lesions.

Now the infection must linger in some parts of the body and, after lying latent for a number of years, come into action again and acutely affect various areas. It has been suggested by Coombs that the lymph glands of the body are the sites of latency. Martland contributes to the view that the mediastinal lymph glands harbour the spirochætes in the latent period. Stern has proved a lymphogenous origin for tabes dorsalis, and it is very probable that both the aortic lesions and tabes dorsalis come from the same reservoir of infection, that is, the mediastinal lymph glands. This explains the occurrence of the Babinski syndrome, either in the complete form of tabes dorsalis with aneurysm or the less complete form of tabo-paresis with aortic incompetence. Lymphadenitis is a prominent feature of secondary syphilis and appears to mark the end of the bacteræmic stage. Presumably this is as true of the internal glands which are hidden from examination as it is of the external glands which are obvious and palpable. Experimental work has demonstrated the persistence of living spirochætes in the lymphatic glands for months or years after an animal has been inoculated with the disease. Moreover, Engmann and Eberson have demonstrated in three cases out of fourteen of general paralysis that the lymph glands contain spirochætes. It is thus very likely that the spirochætal infection lies latent in the main lymph glands, and at the end of the incubation period for the cardiac and nervous lesions, for some reason at present unknown, the infection flares up again and attacks the vital organs. We know that the posterior cervical glands are markedly affected in secondary syphilis, and I suggest that the spirochætes, lying latent in these glands, ascend into the spinal canal and cranial cavity and so cause syphilis of the spinal cord and brain. There is

thus much scope for further research on this interesting problem of the late infection of the central nervous system in syphilis.

CONCLUSIONS

1. Cardiovascular syphilitic lesions are the rule rather than the exception in cases of so-called general paralysis. It is found that clinically 50 to 60 per cent. of so-called paralytics give evidence of cardio-aortic lesions, and that 74 per cent. of the autopsies of paralytics give the same evidence.

2. The latent period after short courses of "606" averages 9–12 years, whereas the latent period after mercury treatment averages 12–20 years. It is certain that early treatment of syphilis with inadequate doses of salvarsan is dangerous.

3. Many of the cases of general paralysis referred to in this paper acquired their infection while on war service and received short courses of "606." Within ten years these cases relapsed badly with cardiac and nervous syphilis. This evidence forms an alarming answer to the questionnaire formulated by the Medical Society for the Study of Venereal Diseases in 1925.

I thank the medical superintendent, Dr. G. H. Grills, for permission to publish the figures and cases referred to in this paper.

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THE PENTNUCLEOTIDE TREATMENT OF AGRANULOCYTIC ANGINA *

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IN her studies on living human blood-cells, Sabin [1] suggested that the stimulus for the production of non-motile polymorphonuclear cells might be products liberated from disintegrating homologous cells.

This led to a study of the leucocyte-stimulating properties of nucleic acid and nucleinates. Doan, Zerfas, Warren, and Ames [2] injected relatively large doses of sodium nucleinate intravenously into rabbits. They found that, after a preliminary decrease of leucocytes, a considerable leucocytosis followed. Their experiments pointed to the spleen as being responsible for the preliminary leucopenia, as after splenectomy this did not occur. Jackson [3] had meanwhile demonstrated the presence of pentose nucleotides in normal human blood. Doan [4] gave intravenous injections of pentose nucleotides into rabbits. He found not only a peripheral leucocytosis, but also a marked myeloid hyperplasia of the tibial bone-marrow. Repeated injections caused neither exhaustion nor malignant change in the myelopoietic elements, and after cessation of the injections the blood gradually returned to its former state.

C. Reich and E. Reich [5] have reported experiments on the Pentnucleotide treatment of rats, either young rats which are normally leucopenic, or those rendered leucopenic by previous treatment with benzol. Their results were uniformly negative, but they admit that benzol poisoning may not provide conditions comparable with human agranulocytosis. R. F. Phillips (unpublished) has recently tested for the Therapeutic Trials Committee the effect of pentnucleotide in rats made leucopenic by irradiation. No significant change was produced in the leucocyte counts of these animals, and the treated rats survived no longer than the corresponding controls.

In the human subject the syndrome of agranulocytic angina described by Schultz [6] presents a very constant picture. It commences with rapid onset of vague symptoms of lassitude. Then follows a general prostration accompanied by a rapidly spreading lesion in the mouth, both being characterised by a severity out of all proportion to the pathogenicity of the organisms found in the lesions. Examination of the blood reveals a complete, or almost complete, absence of polymorphonuclear leucocytes.

This is undoubtedly a rare condition, but since the original description several cases have been described and their treatment with pentnucleotide recorded. Jackson, Parker, and Taylor [7] reported a series of 69 cases collected from various sources, of which 74 per cent. recovered after pentnucleotide treatment. Cases treated with pentnucleotide have also been reported in this country by Bulmer,[8] Fairley and Scott,[9] and Marriott [10]; of these, two recovered, the case of Fairley and Scott being fatal.

In man the response takes the form of a steady increase of granulocytes. Jackson noted that this began as a rule on the fifth day after the commencement of treatment; but Doan's cases showed an immediate rise. Doan [4] also drew attention to the fact that the myelocytes showed a marked increase at the beginning of treatment, falling off again as the polymorphonuclear cells returned towards normal levels. This myelocytic response somewhat resembles the reticulocyte response in pernicious anæmia. The preliminary leucopenia noted by Doan in his experiments on rabbits has not been observed in the human cases so far recorded.

Last year the Therapeutic Trials Committee of the Medical Research Council accepted an application for clinical trials of pentnucleotide, and one of us (J. F. W.) was asked to coöperate in the tests of this product on the committee's behalf. The application to the committee was made by Messrs. Menley and James Ltd., agents in this country for the Smith, Kline and French Laboratories of Philadelphia, who manufacture pentnucleotide. In view of the rarity of cases of true agranulocytic angina (for which condition pentnucleotide is specially recommended), it has been felt justifiable to publish this single case as a preliminary report to the Committee.

CASE RECORD

A housewife, aged 34, was admitted to hospital on March 13th, 1934. Fifteen months previously she had had a severe attack of diphtheria. After her return home

* A Report to the Therapeutic Trials Committee of the Medical Research Council.

she began to have recurrent attacks of tonsillitis, accompanied by general weakness. In October, 1933, she developed a generalised dermatitis which improved under treatment. On March 8th she became suddenly ill and complained of dysphagia, cough, and painful swellings below the jaw. The following day there were generalised joint pains, headache, and nausea; rigors occurred with much perspiration. The dysphagia increased rapidly in severity, and there appeared a rash of septic spots on both hands. The gums and mucous membrane of the mouth became very swollen and painful.

On examination the patient was in a very toxic condition with a temperature of 103° F., a pulse-rate of 124, and a respiration-rate of 24 per minute. The gums were very swollen, especially over the posterior alveolar processes; the mucous membrane was congested, and there was a rash of small yellow spots, about 3 mm. in diameter, over this area, but actual ulceration was absent. The buccal mucous membrane, the palate, pharynx, and tonsils were similarly affected, but the rash was less marked. In these areas, and on the lips, some of the spots had discharged their contents leaving minute ulcers with a red base. The tongue was very furred with ulcerated edges. The lower teeth were in fair condition; the upper teeth had been extracted. The submaxillary glands were swollen and tender on both sides; the cervical lymph glands also showed some enlargement. Over both hands there was a septic rash similar to that present in the buccal cavity. On the abdomen there was a scarlatiniform rash, which rapidly faded. Perspiration was profuse. The breath had a very unpleasant odour.

The abdomen moved normally on respiration. Neither liver nor spleen was enlarged. The inguinal glands were not palpable. The lungs showed some râles at the bases. The tendon reflexes were somewhat brisk; otherwise the central nervous system presented no abnormalities. The heart was not enlarged; the sounds were of good quality; there were no murmurs. Occasional periods of tachycardia occurred. The blood count showed:—

Red cells	3,690,000 per c.mm.	Polymorphonuclears	Nil
Hæmoglobin	76%	Lymphocytes	97%
Colour-index	1·02	Large mono-nuclears	Nil
White cells	1,000 per c.mm.	Türck cells	3%
Nucleated red cells	Nil		
Platelets	Fairly abundant.		

Blood culture was negative. Examination of a swab from the throat showed a few streptococci, and on culture a small growth of non-hæmolytic streptococci was obtained.

On admission 30 c.cm. of scarlatinal antitoxin was given intramuscularly. This had no obvious effect. Three days after admission treatment with pentnucleotide was commenced. An initial dose of 40 c.cm. was given intramuscularly, followed by 20 c.cm. daily on the succeeding four days, and then three daily doses of 10 c.cm., making a total of 150 c.cm. of pentnucleotide administered in eight days. At the end of this period the blood count was:—

Red cells	3,920,000 per c.mm.	Polymorph.	50·0%
Hb.	78%	Lymphocytes	37·5%
C.I.	1·00	Large mono.	1·5%
White cells	8300 per c.mm.	Eosinophils	Nil
Platelets	Abundant	Basophils	Nil
		Myelocytes	8·5%
		Türck cells	2·5%

The clinical condition was also much improved. The temperature had returned to normal levels, the pulse was 84 and regular. The rash of septic spots had disappeared from the mouth, although some swelling was still present. The condition of the hands was greatly improved.

This improvement was steadily maintained, and on April 3rd, three weeks after admission, she returned home. The white cells count was now 7200 per c.mm., of which 52 per cent. were polymorphonuclears. She has since been seen on April 17th and May 24th, when the granulocytes showed some diminution; her clinical condition was very satisfactory. Full details of the blood counts and treatment are given in the accompanying Table, and are shown in the Figure. It will be seen that this case reproduces the type of response noticed by Doan. The granulocytes commence to rise immediately after the exhibition of pentnucleotide and there is a myelocytic response.

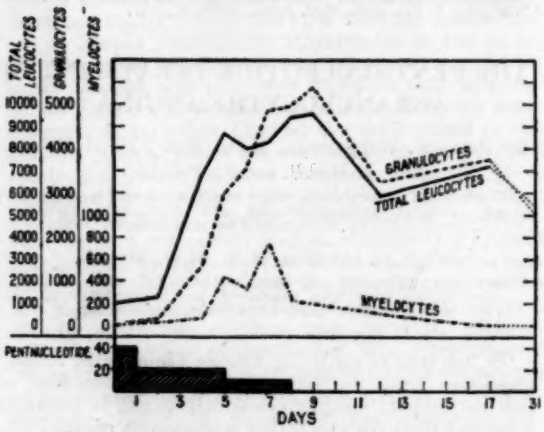
The lesions on the hands were treated with eusol dressings, and the mouth was kept clean with hydrogen peroxide washes.

Table of Blood Counts

Day.	Pentnucleotide c.cm.	R.B.C.'s millions.	Hæmoglobin per cent.	W.B.C.'s.	Total granulocytes.	Lymphocytes.	Myelocytes.	Türck cells.
					Percentages and total number per c.mm.			
0	Nil	3,688	76	1000	Nil	97 (970)	Nil	3 (30)
1	40	—	..	—	—	—	—	—
2	20	—	..	1300	8 (104)	78 (1015)	3 (39)	7 (91)
3	20	—	..	—	—	—	—	—
4	20	—	..	6800	19·5 (1312)	64 (4350)	1 (68)	8 (545)
5	20	—	..	8600	35·0 (3016)	54 (4650)	5 (430)	5 (430)
6	10	—	..	8000	44·0 (3520)	50 (4000)	4 (320)	3 (240)
7	10	3,920	78	8300	58·5 (4855)	37·5 (3100)	8·5 (705)	2·5 (210)
8	10	—	..	9400	53·0 (4985)	43 (4050)	2·5 (235)	1·5 (140)
9	Nil	—	..	9600	59·0 (5692)	38 (3650)	2 (192)	0
12	Nil	—	..	5900	56·0 (3250)	41 (2420)	2 (118)	0
17	Nil	4,800	98	7200	52·0 (3740)	30 (2160)	0	0
31	Nil	4,660	84	5400	42·0 (2270)	50 (2700)	0	1·25 (68)
45	Nil	—	..	6500	40·0 (2600)	52 (3380)	0	1·0 (65)
68	Nil	4,490	91	4600	44·0 (2020)	51 (2340)	0	0

COMMENT

The case described above presents the typical features of agranulocytic angina—namely, rapid onset, mouth lesions, low pathogenicity of organisms isolated from these lesions, and a myelocytic response following pentnucleotide therapy. In such cases the question arises as to whether recovery is truly due to the therapeutic agent employed, or whether it is a spontaneous recovery. Before nuclein



therapy agranulocytic angina seems nearly always to have ended fatally. Jackson and his associates [7] and Reznikoff [11] have reported a considerable proportion of successes with nuclein therapy. There does, therefore, seem to be definite ground for attributing the recovery of most of these cases to the nuclein preparation employed.

The evidence of regeneration of the myelopoietic tissues as shown by the myelocytic response favours the view that agranulocytic angina is primarily a

marrow dyscrasia, and that the mouth symptoms are secondary in nature. Agranulocytosis may, however, also occur as an event in a long illness, as in the case of Fairley and Scott.[9] In these cases the prognosis is, of necessity, less favourable.

Madison and Squier[12] have recently recorded cases of agranulocytosis which they attribute to poisoning with amidopyrin, either alone or in combination with a barbiturate. Their observations provide further support for the hypothesis that the marrow condition is primary. In the case recorded here neither of these drugs had been given.

This patient was menstruating at the time of onset of the agranulocytosis. Thompson[13] noticed that the onset of agranulocytosis in the majority of the women patients under his care corresponded with the commencement of their menstrual periods; whether this is purely coincidental or has a definite ætiological meaning is not at present known.

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AGRANULOCYTOSIS COMPLICATING TYPHOID FEVER

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THE characteristic feature of the hæmatological findings in an established case of typhoid fever is a well-marked leucopenia which follows the fleeting neutrophilia met with in the initial stages of the disease. In uncomplicated cases the lymphocytes are present in the peripheral circulation in greater numbers than the neutrophils, which are reduced numerically. In a favourable case the neutrophilic recovery sets in towards the end of the third week of the illness and although a post-infective lymphocytosis usually occurs the total leucocyte count falls within the accepted normality range in the early phases of convalescence.

A gradual fall in red cells occurs as the disease progresses, indicating a depressed state of both the erythropoietic and granulocytic functions of the bone-marrow. According to Piney,[1] however, the neutropenia in typhoid fever is a manifestation of impaired emigration of granulocytes from the marrow rather than an indication of defective formation, since a superadded septic condition evokes a neutrophilia of the ordinary type. While this may be so, the following case points to progressive impairment of marrow function to the stage of almost complete aplasia.

Clinical Data.—The patient, a boy of 12 years, was admitted to the Salisbury Hospital suffering from typhoid fever. At the time of admission his illness had lasted approximately ten days and his serum showed an agglutinating titre of 1 in 250 for *B. typhosus* antigen. It is of interest in view of the subsequent history of the case that the agglutinating power of the serum failed to increase as the disease progressed. For three weeks the temperature swung between 99° F. and 100° F., with a pulse-rate varying between 70 and 90 per minute. During the fourth week drowsiness became pronounced, the temperature became more hectic in character, and the pulse-rate increased. Early in the sixth week the patient became jaundiced and complained of sore-throat with difficulty in swallowing. The angina grew rapidly worse and a sloughy membrane developed over the tonsils and fauces. The submaxillary lymph glands were enlarged and tender and the breath became exceedingly offensive. Cultures made from throat swabs gave a mixed growth of staphylococci and short-chained streptococci. No diphtheria bacilli were found at any time.

The hæmatological findings taken in conjunction with the clinical condition showed that the patient was now critically ill. Consequently 250 c.cm. of citrated blood were given intravenously and injections of nuclein instituted, but no response was obtained and the patient died after an illness of approximately eight weeks' duration. No post-mortem examination was made.

Hæmatological Findings.—As the case was considered to be one of ordinary typhoid fever, an opportunity of investigating the condition of the blood did not present itself until after the onset of jaundice and sore-throat. Thereafter, however, blood counts were carried out daily until death occurred. The hæmatological findings are summarised in Tables I. and II.

TABLE I

Date in May.	W.B.C.'s per c.mm.	Neutrophils.	Lymphocytes.	Large mononuclears.	Eosinophils.
12	1200	4	90	6	—
14*	800	—	87	13	—
15	800	—	81	19	—
16	800	—	82	18	—
17	500	—	83	17	—
18†	—	—	—	—	—
19†	500	—	84	16	—

* May 14th: 250 c.cm. citrated blood intravenously.
† May 18th and 19th: 0·03 g. nuclein intramuscularly.

TABLE II

Date in May.	R.B.C.'s per c.mm.	Hb. % (Newcomer).	Colour-index.	R.B.C. diameter in microns.	Reticulocytes. per cent.
12	3,750,000	75	1·01	7·48	3·8
14*	3,040,000	75	1·25	7·48	3·6
15	3,220,000	83	1·3	7·48	2·4
16	3,310,000	82	1·18	7·48	2·4
17	—	—	—	—	1·0
18†	—	—	—	—	—
19†	2,240,000	53	1·2	7·48	0·6

* May 14th: 250 c.cm. citrated blood intravenously.
† May 18th and 19th: 0·03 g. nuclein intramuscularly.
W.B.C. = white blood-cell. R.B.C. = red blood-cell.

As already mentioned, in a typical case of typhoid fever the return of the leucocytes to normal numbers sets in during the early phases of convalescence, but when hæmatological investigations were instituted in the present case it was evident that not only was there a profound leucopenia, but that the granulocytic function of the marrow was seriously impaired. In the space of a week the white cell count fell from 1200 to 500 cells per cubic millimetre with complete absence of granulocytes from the peripheral circulation except on the day of the initial count, when the neutrophils constituted only 4 per cent. of the total white cells (see Table I.). Thereafter they disappeared from the circulation and were never subsequently demonstrated. It is also worthy of note that many of the large mononuclear cells showed severe degrees of nuclear degeneration together with gross vacuolation of the cytoplasm.

The initial blood count showed in addition to a reduction in white cells a marked degree of anæmia and, as indicated in Table II., the fall in red cells

occurred pari passu with the fall in the leucocyte count.

A daily reticulocyte count provided significant information concerning the functional activity of the erythroblastic marrow. From an initial percentage of 3·8 the reticulocytes steadily diminished in numbers and, as indicated in Table II., the percentage on the day of death had fallen to 0·6. From those figures it may be concluded that immediately prior to death a condition of almost complete marrow aplasia existed. The depressed state of the marrow in the last week of the illness was such that no response was obtained either from blood transfusion or from intramuscular injections of nuclein. Although only two such injections were given, there is no reason to suppose that a granulocytic recovery could have occurred at this stage of the disease.

On reviewing the case as a whole it appears that the leucopenic state induced by the *B. typhosus* infection was associated with a markedly inadequate response on the part of the patient's immunity mechanism, if one may take the agglutinating titre of the serum as a criterion of the magnitude of the immunity response. The titre of the serum was estimated on several occasions and, as already indicated, never rose higher than 1 in 250. With the immunity mechanism depressed the septic anginal condition readily developed and the superadded toxæmia induced not only an agranulocytic state but a generalised inhibition of marrow function.

It is now recognised that in addition to idiopathic agranulocytosis first described by Schultz [2] in 1922 secondary agranulocytosis is met with in a variety of conditions. Thus Fried and Dameshek [3] claim to have produced leucopenia with granulopenia in experimental animals with strains of *B. suipestifer* isolated from human beings, and in rare instances an agranulocytic state has developed after injections of *B. typhosus* vaccine. The present case may be interpreted therefore as a secondary agranulocytosis complicating typhoid fever.

I wish to express my thanks to Dr. A. P. Martin, medical superintendent of the Salisbury Hospital, for kindly allowing me to investigate this case.

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THE FATE OF FOLLICULAR HORMONE IN THE LIVING BODY

FORMERLY PROFESSOR OF GYNÆCOLOGY AND OBSTETRICS IN THE UNIVERSITY OF BERLIN

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THE following is a brief report of experiments dealing with the fate of œstrogenic hormone (folliculin œstrin) in the living body. A comprehensive paper in the *Skand. Arch. f. Physiologie* will deal with the literature and experimental technique.

After the oral or subcutaneous administration of folliculin only very small quantities are excreted in human or animal urine in an active state. In the case of a woman of 49 who had received during a period of 15 days 54 mg. = 540,000 mouse units of folliculin (α-hormone), I was able to discover only 1·6 mg. = 16,000 m.u. (i.e., 3 per cent.) in the urine. A sexually mature man who received a single subcutaneous dose of 40,000 m.u. excreted less than 5 per cent. during a period of ten days. The excretion in the case of rats is still less. Even after the injection of 20,000 m.u., which is a very big dose for a rat, no folliculin is excreted in the urine. What becomes of the hormone inside the body? Does it get stored up in the organs, or is it inactivated or destroyed? For the investigation of these questions infantile rats which had been given folliculin subcutaneously were analysed in toto. The animals were well minced and for this purpose the hide as well as any excreta (urine and fæces) that had been passed in the meantime were included. The resulting tissue pulp was subjected to exhaustive extraction by means of organic solvents. This produced the astonishing result that already three hours after the injection of folliculin (α-hormone) only very small quantities thereof could be demonstrated in the animal. On the introduction of 40,000 m.u., which is a very large dose for an infantile rat, only about 1 per cent. of the hormone was rediscovered in the total animal 72 hours after injection. So that 24 hours after the introduction of folliculin only traces can be rediscovered in the animal and this at a period when the biological effect of the hormone on the uterus and vagina is not yet visible.

From this it appears that α-hormone does not become stored up in the body, at all events not in an active state. Further experiments showed that α-hormone gets inactivated in the body. It was possible by hydrolysis to reactivate a part of the inactivated folliculin, the yield being, after 24 hours, 20 per cent. instead of 1 per cent. and, after 48 hours, 6 per cent. instead of 1 per cent. The fact that reactivation is possible in larger quantities at the end of 24 hours than at the end of 48 hours suggests that during the period that inactivation is taking place various bodies are produced which are capable of reactivation by hydrolysis in differing degrees. Reactivation is, however, only partially possible (maximum 20 per cent.). Whether the remaining 80 per cent. are so transformed by the body that they cannot be regenerated by our chemical methods (hydrolysis) or whether the body destroys any excess of hormone introduced cannot be said. Inactivation of α-hormone occurs apparently in the liver by means of enzymes. It does not take place in other organs nor in the blood. The experiments showed that folliculin becomes fixed by adsorption to the cell-wall in varying degrees, the adsorption being most intensive in the case of striped muscle.

In contradistinction to α-hormone, hormone benzoate is not inactivated in the body. From this there follows the supposition that the inactivating process attacks that part of the hormone molecule which in the case of hormone benzoate becomes saturated as a result of esterification with benzoic acid.

Folliculin is inactivated not only by warm-blooded animals, but also by cold-blooded animals and plants. Inactivation in cold-blooded animals (frog) is less than in warm-blooded animals (rat), being only 80 per cent. in the former and over 95 per cent. in the latter. In the hyacinth inactivation occurs in the root, as H. v. Euler and I have recently shown. Folliculin does not become inactivated by means of yeast.

I am indebted to Dr. Bernard Homa for the translation of this paper.

THORACOSCOPY BY SINGLE PUNCTURE

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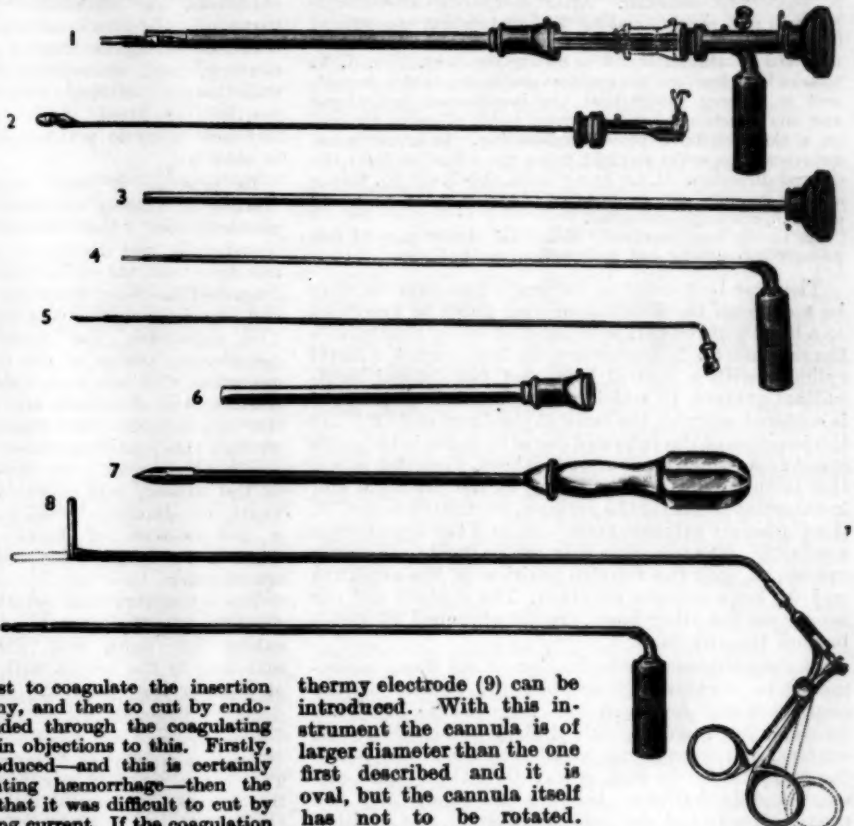
EXPERIENCE has shown that a large proportion of pleural adhesions, perhaps the majority, can be severed by the single-puncture method of thoracoscopy. If it can be done safely there is every advantage in avoiding the extra trauma involved in the two-cannula method—the risk of surgical emphysema is lessened and by a nervous patient the avoidance of the extra pricks of the local anæsthetic needle will be appreciated. I am not maintaining that this technique is always better than the two-cannula method—in fact, with the latter there is more mobility; if a small artery should spurt it is easier to get the lamp and the end of the telescope out of the way of the blood and so keep the bleeding point in view. Interchange of telescope and electrode is possible, thus more adhesions may become accessible at the one operation. In some cases I am sure that to have separate entry for light and operating instruments is essential, and with this method the technique of G. Maurer, of Davos, is probably the best and safest. With the right-angle telescope a much larger area of the pleural cavity can be brought successively into view, and it is possible to see round the edges of the adhesion. But whatever instrument or method is employed a right-angle telescope is an essential adjunct, and I invariably use it for a preliminary survey and not infrequently during the course of the operation.

The first instrument I described[1] employed a 30° telescope and was designed first to coagulate the insertion of the adhesion by diathermy, and then to cut by endothermy with a wire protruded through the coagulating electrode. There were certain objections to this. Firstly, if over-coagulation was produced—and this is certainly the safest way of preventing hæmorrhage—then the resistance became so great that it was difficult to cut by diathermy, even with a strong current. If the coagulation was not so complete the cutting was so sudden that hæmorrhage might be produced, and also the cut might be so fine that the adhesion failed to gape, and consequently coagulation of the deeper parts was rendered difficult and uncertain. The illumination was not very good. Moreover, to anæsthetise the pleural attachment of the adhesion or its neighbourhood it was necessary first to pass a direct vision telescope alongside which was passed the anæsthetising needle. This meant more instruments and the passing and withdrawing of various instruments. To obviate this Mr. R. Schranz, of the Genito-Urinary Manufacturing Company, made for me two very fine insulated rods which could be inserted alongside the telescope, one for diathermy coagulation and cutting, the other for electrocautery. These acted well, but the electrodes were naturally flimsy and bendable. I felt there was not sufficient control of bleeding, and the different instruments had to be passed in one at a time, which meant frequent changing and manipulation.

[1] THE LANCET, 1930, i., 232.

THE IMPROVED PATTERN

The instrument I now use has developed from the experience gained over the last five or six years. With it I have divided without hæmorrhage, without special difficulty, and without serious reaction, not only easy cord and band adhesions but wide adhesions 2½ inches in width and more, and of a thickness in parts up to ½ inch, and also series of adhesions. It has proved itself highly efficient. It is strong, the field of vision is wide, the illumination brilliant. The electrode carrier (4) is rigid, the electrode itself strong and not easily bent, and is of sufficient size to prevent and control bleeding. Should this occur, however, or if the adhesion is very vascular, or large vessels are encountered, a larger ball-shaped diathermy electrode (9) can be introduced. With this instrument the cannula is of larger diameter than the one first described and it is oval, but the cannula itself has not to be rotated. Coagulation is done by diathermy and cutting by electrocautery. Cutting can be done by endothermy if desired. The two currents are carried by the same electrode, which is a platinum-iridium loop. The currents are controlled by a bi-pedal footswitch. All the instruments required are ready for use in the cannula—needle, telescope, and electrode. Therefore, local anæsthetisation in the pleural cavity and cutting can be done without moving any of the instruments. The electrode can



be removed and replaced by a Maurer's hook (8). The advantages of the instrument are the complete control allowed over the operative procedure, the steadiness and rigidity, the assemblage of practically all essential instruments together so that everything required is to hand at the one spot, and lastly ease of handling. There is no doubt that the single-puncture method is much easier than the two-cannula method, and to those who have only occasional use for thoracoscopy this must be a great advantage. For one thing the considerable difficulty of orientation is eliminated. It is true that after sufficient practice orientation and the "picking up" of instruments and objects becomes almost automatic, nevertheless it is obvious that some find the difficulty quite appreciable, and others may not be able to get sufficient practice.

At the moment the 30° purely diathermy instrument has been abandoned. To cut by endothermy is undoubtedly the quickest method, but after considerable experience I have come to the conclusion that it is safer to pursue the slower method of coagulating by diathermy and cutting by the electrocautery. Of course, endothermy cutting can be done with a coarser electrode, but the danger of hæmorrhage is not entirely eliminated.

With a single-puncture instrument accurate localisation is absolutely essential. After comparing stereoscopic pictures and the original method of rotating the patient described in your columns [1] I have come to the conclusion that the rotating method is by far the best. Dr. J. V. Sparks has given me the greatest assistance in this respect, and it is very rarely that the localisation beforehand and the selection of the optimum point of entry by trial on a skeleton have proved misleading. It is the usual experience to come straight upon the adhesion from the desired direction. If, for any reason, this is not so, then a second cannula can be inserted, either for the telescope or the operating instrument.

As in the one previously described, every part of this present instrument can be sterilised by boiling.

The new thoracoscope for single puncture (as may be seen from the illustration) can aptly be described as a bundle of rods (1) held together by an oval tube—the cannula (6). The nucleus is the lamp carrier, a metal cylinder with a central hole, and two lateral longitudinal grooves, to which a thin but firm metal tube is soldered carrying the lamp at the distal end (2). At the junction of the tube and metal cylinder is the cable connexion, which encircles the whole. Grouped round this lamp carrier, and engaging at the proximal end in the grooves cut for the purpose, are the telescope (3), the diathermy galvanocautery (4), and the hypodermic needle (5). The telescope only can be fixed to the lamp carrier, so that the relative position of the objective and the lamp remains constant. The cautery and the needle, on the other hand, can be advanced 1½ inches beyond the objective.

The simultaneous introduction of all these instruments is obviously impossible, the calibre of the cannula would be much too large to be practical. In order to overcome this difficulty the telescope, cautery, and hypodermic needle are assembled round the lamp carrier in such a way that their distal end reaches only half-way between the lamp and the proximal end, and are held together in this position by a clip. The lamp, which occupies nearly the whole lumen of the cannula, is then introduced first, and after emergence at the other end the remaining components are advanced. The cannula is oval in cross-section and just large enough to hold the rod-like components in close proximity. The lamp, when in the pleural cavity, lies really outside this bundle of rods.

[1] Ibid., 1930, ii., 74.

As already mentioned the telescope is locked to the lamp carrier when in position. The cautery and needle, when not required, hold by friction on the metal cylinder of the lamp carrier, and are out of view in this position. The instruments are of sufficient length to provide ample movement in the pleural cavity without moving the cannula. The drawback of having to rotate an oval cannula in the limited intercostal space is obviated by the direct vision telescope. The angular aperture of the telescope has been pushed to its furthest limits. The visual field is such that a good survey of the pleural cavity can be carried out.

The illumination is entirely novel. It is provided by a lamp which concentrates all the available light over an area roughly equal to the field of vision. The corresponding gain in clarity and definition is very noticeable. The combined galvanocautery and diathermy electrode is a rigid rod, the core of which is composed of two conductors insulated one from the other, carrying the low-tension current which brings the cautery point to a red heat.

In addition to the relatively thin insulation required for the low voltage, an insulating sheath of sufficient thickness to withstand high-frequency currents surrounds the two conductors. The instrument can therefore serve the triple purpose of bipolar galvanocautery, and monopolar diathermy electrode, or endothermy cutting electrode. The hypodermic needle is fitted with a record mount and bayonet catch to which a suitable syringe (5 c.cm.) is attached.

In practice it soon became apparent that this method of cutting adhesions complicated the wiring problem—i.e., the various connexions from the transformer and diathermy apparatus. To eliminate this drawback the endo-diathermy apparatus formerly described has been fitted into a slightly larger cabinet, and separate cautery and light transformers built in. The apparatus was thereby transformed into a distributing centre of the three circuits required for operation with one main cable feeding all three. All controls and terminals are situated in the panel on the apparatus. The cautery and endo-diathermy circuits are interconnected and controlled by a selector footswitch. As one or other pedal is pressed, so the cautery will function as galvanocautery (red heat) or diathermy electrode. The light circuit is independent of these two and permanently connected to the main via a separate earth-free transformer.

The apparatus can be wheeled into a convenient position near the operating table, and the two bipolar cables for light and diathermy galvanocautery attached to the towels with a clip, and do not drag or hamper the operator.

LIVERPOOL ROYAL INFIRMARY: ANNUAL REPORT.—The report for 1933 records that it is many years since this hospital has been able to show both a reduction of expenditure and a credit balance. Since, however, the ordinary income was £46,941, and the ordinary expenditure £49,621, there would have been a substantial loss on the year's working but for the use for general maintenance purposes of free legacies amounting to £5895. The debt on the nurses' home has been paid off, but a further £21,000 will be needed to complete it. Last year there were 6676 new in-patients—a large increase—who stayed 15·19 days, a reduction of one day; there were 47,748 new out-patients. Receipts from private wards were £4311 in the first completed year, and it is proposed to build a further 14.

THE LYSIS OF PNEUMOCOCCI BY SODIUM DESOXYCHOLATE

EFFECT OF VARYING CONCENTRATIONS OF SODIUM CHLORIDE

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THE experiments reported here were suggested by the observation that high concentrations of potassium phosphate added to broth cultures of pneumococci facilitated the lysis of the organisms by sodium desoxycholate.

The favourable effect of magnesium sulphate on the lysis of pneumococci by bile-salts has been reported by Nicolle and Adil-Bey (1907). According to Falk and Yang (1926) the chlorides of monovalent cations (Na, K, NH_4, Li) in relatively low concentrations (0·004–1·0 per cent.) inhibit dissolution of washed pneumococci by bile, but in higher concentrations (2·0 and 4·0 per cent.) these chlorides may accelerate the dissolution of the bacteria. In Falk and Yang's experiments the chlorides of divalent cations Ca and Ba inhibited the lysis of pneumococci by bile more effectively in high than in low concentrations. Their experiments were limited in that they used only one concentration of bile with varying concentrations of electrolyte.

In the present communication the effect of varying amounts of sodium chloride and sodium desoxycholate on the lysis of washed pneumococci is described.

EXPERIMENTAL

The organism, a strain of pneumococcus Type I., was grown in veal broth prepared according to the method described in a previous paper (Hart and Anderson, 1933). The well-grown but not autolysed culture was centrifuged and the cells washed twice with M/20 phosphate buffer pH 7·0 and suspended in this buffer solution. The deposit obtained from 200 c.cm. of culture was suspended in 40 c.cm. of buffer. The bacterial suspension was measured into test-tubes (6 × ¾ in.) in amounts of 1 c.cm., and water and solutions of sodium chloride and sodium desoxycholate (B.D.H.) were added in that order, the final volume being 2·4 c.cm. The tubes were shaken and immediately placed in a water-bath at 35° C. for 60 minutes. The final concentration of sodium chloride varied from 0 to 15 per cent., and of sodium desoxycholate from 1 in 800 to 1 in 60,000. After an hour in the water-bath the tubes were observed and the minimum concentration of sodium desoxycholate that gave a water-clear solution was noted for each concentration of sodium chloride.

When the minimum concentration of sodium desoxycholate in milligrammes per 100 c.cm. is plotted against the concentration of sodium chloride in grammes per 100 c.cm. a curve such as that shown in the Figure is obtained. The curve given, which represents the combined results of two experiments, is in the form of a rectangular hyperbola. It will be seen that there is a reciprocal relationship between the concentration of sodium chloride and the concentration of sodium desoxycholate required to produce lysis. When the amount of sodium chloride is small an increase of one or two grammes per 100 c.cm. in its final concentration produces a relatively large increase in the sensitivity of the system to desoxycholate. When the final concentration of sodium chloride is above 5 per cent. any further increase produces very little increase in sensitivity, and even in the highest concentrations of salt some desoxycholate was required to produce lysis. It should be noted that the solutions that contained no chloride contained other electrolytes, in the shape of sodium and potassium phosphates, provided by the buffer solution. These electrolytes produced some increase in sensitivity, as was shown by other experiments in which distilled water was used for washing and suspending the bacterial cells. It was found that the desoxycholate would still lyse the cells in the absence of sodium chloride, but that higher concentrations were required than when the cells were suspended in buffer.

In the method described above the readings were made at 60 minutes. In another experiment, in which readings were also made at 30 minutes, comparison of tubes containing the same amount of desoxycholate showed that the rate of lysis was increased by raising the final concentration of sodium chloride. For example, in a tube containing sodium desoxycholate in a concentration of 33 mg. per 100 c.cm. and sodium chloride 0·4 per cent. lysis was only partial at 30 minutes but complete at 60 minutes, while in another tube, containing the same amount of desoxycholate and 1·0 per cent. sodium chloride, lysis was complete in 30 minutes.

These results are not in agreement with the conclusions of Falk and Yang that sodium chloride in low concentrations inhibits the lysis of washed pneumococci by bile. But this difference is possibly due to the use, in our experiments, of pure sodium desoxycholate, instead of bile, as the lytic agent.

The effect of sodium chloride on the lysis of pneumococci by sodium desoxycholate may be compared with the work of Yeager (1929) on hæmolysis. He found that the resistance of red cells to lysis by sodium taurocholate was inversely proportional to the concentration of sodium chloride when the latter varied from 0·85 per cent. downwards, the isotonicity of the solutions being maintained by appropriate additions of sucrose.

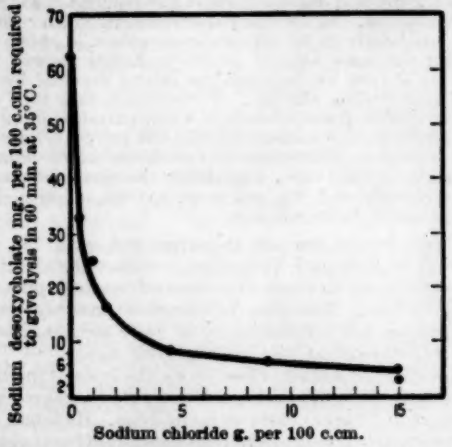
TREATMENT OF EMPYEMA WITH BILE-SALTS

A number of papers have appeared recently on the treatment of pneumococcal empyema by the injection of bile-salts into the abscess cavity after aspiration of the pus. Cocchi (1931), Schwartz (1932), and Thomson (1933) used sodium taurocholate, whilst Sworn and Cooper (1934) used sodium desoxycholate. The results described above suggest that this treatment might be more efficacious if the pneumococci in the empyema cavity were exposed to a relatively high concentration of sodium chloride at the time of introduction of the lytic agent. It would seem best in practice to aspirate the pus, wash out with hypertonic saline, leaving a hundred or more cubic centimetres in the cavity, and then immediately to inject the sodium desoxycholate dissolved in a small volume of water.

Apart from the question of their toxic effects, the quantities of sodium desoxycholate, and sodium chloride that can be used are limited by the solubility of the bile-salt in solutions of the chloride. For example, whereas 100 c.cm. of 5 per cent. sodium chloride will dissolve 5·0 g. or more of sodium desoxycholate, the same volume of 7·5 per cent. sodium chloride will only dissolve 0·1–0·15 g. of the desoxycholate. If, therefore, the final concentration of sodium chloride, after washing out the empyema cavity, were greater than 5 per cent., the quantity of sodium desoxycholate that could be injected for each hundred cubic centimetres of fluid remaining would be necessarily restricted. With a concentration of 5 per cent. or less the limit of solubility would not be reached.

The total dose of sodium desoxycholate used by Sworn and Cooper for each injection was 0·25–1·0 g., but our in-vitro experiments suggest that a considerably smaller dose would be effective even if the contents of the cavity at the time of the injection amounted to several hundred cubic centimetres, provided that the concentration of sodium chloride were at least 1·5 per cent. (see Figure).

It should be made clear that the method outlined above has not so far been applied by us in treating cases of pneumococcal empyema. While therefore suggestions are made as to the range of final concentrations of sodium chloride to be aimed at in the abscess cavity, the actual figure must at first be chosen



The effect of sodium chloride on the lysis of washed pneumococci by sodium desoxycholate.

with caution, particularly if the pleura is considered to be not much thickened, in order to avoid any possible painful or other irritative effect due to the hypertonicity or high electrolytic content of the saline solution.

SUMMARY

(1) Sodium chloride was found to increase the susceptibility of washed pneumococci to lysis by sodium desoxycholate, there being a reciprocal relationship between the concentrations of these two substances required to produce dissolution of the bacteria. (2) It is suggested that the augmentation of the lytic action of sodium desoxycholate by sodium chloride might be applied in the treatment of pneumococcal empyema with bile-salts.

We are indebted to Prof. C. C. Okell, in whose laboratory this work was carried out, and to Dr. F. C. Roles, for their advice. The work was carried out during the tenure by one of us (A. B. A.) of a part-time grant from the Medical Research Council.

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DERMATITIS DUE TO LINSEED

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It is well known that dermatitis can be produced by many substances, but it is not always realised that very simple and ordinary substances can provoke the disease. Linseed is generally looked upon as a harmless substance, but cases of dermatitis due to it have been recorded. Prosser White,[1] in his exhaustive book on the occupational diseases of the skin, mentions several observers who have recorded a linseed dermatitis. One of them, Vokoun, investigated the subject in the United States, and indicates that linseed dermatitis is not uncommon in factories where the oil is expressed.[2] In one series quoted by Vokoun it would seem that it was not the linseed but the burlap bags in which it was packed which caused the dermatitis. Kooperman, quoted by Vokoun, thinks that it is not the oil but the dust from the seed, both ground and seed, which causes the dermatitis, and in a footnote Prosser White states that from the description given by Vokoun in one of his publications it might be due to the dust and not the oil. The following instance which recently came under my observation may be of interest.

The patient, aged 28, is regularly employed in discharging cargo from ships, usually unloading grain but occasionally handling other cargoes. He has been so employed for about 12 years and has not had any previous skin trouble as the result of his work. On Feb. 15th and 16th he discharged barley, on the 17th and 19th linseed, and on the 20th maize. The linseed is already packed in bags and he carries these ashore, but has to fill the other substances into bags before taking them ashore. On the evening of Feb. 19th he noticed slight itching on the back of the neck. The following day the whole of the neck was inflamed, and on the 21st the eyes became swollen and redness appeared in front of both elbows. He attended the Royal Infirmary on this day. The eyes were swollen, there was redness over both ears, while over an area sharply demarcated under the jaw and chin and extending laterally out towards the acromion process on each side and downwards both in front and behind like an old-fashioned lace collar, there was a marked dermatitis venenata. In front of each elbow there was a diamond-shaped area of redness but no vesiculation. A few days later the dermatitis reached from the shoulder to the wrist on each side though the original areas in the antecubital fossæ were much better, as was also the dermatitis on the face and neck.

On March 7th, when the acute stage had entirely passed off, he was tested with maize and linseed to discover which was responsible. Some uncrushed maize seeds were applied dry as a patch test while others were moistened before being applied. Patch tests were made with linseed in the same way. Nothing was seen on March 8th, but on the 9th there was a marked positive reaction where the wet linseed had been applied. Coincident with the appearance of the reaction there was a definite focal reaction, the dermatitis at the original sites on the neck and in front of the elbows showing a marked exacerbation. This gradually subsided as the original condition had done.

This case would suggest that the dust from the seeds and not the oil was responsible for the dermatitis. According to Vokoun, the Indian seed is more irritating than the other varieties. A member of the insurance company dealing with the man's claim kindly made inquiries and elicited the information that it was the Indian seed which was being unloaded in this case.

[1] White, R. P.: The Occupational Affections of the Skin, 3rd edition, London, 1928, p. 331.
[2] Vokoun, F. J.: Jour. Amer. Med. Assoc., 1927, lxxxix., 20.

RADIUM FOR KING'S COLLEGE HOSPITAL.—An appeal is made by the committee of management for a much larger supply of radium. The existing supply, given by private donors, is so inadequate for bare requirements that last year it was necessary to supplement it by the use of a radon at a cost of £100. It is stated that an expenditure of £1200 is immediately imperative if patients are to "receive the treatment which they are entitled to expect in a large hospital."

REVIEWS AND NOTICES OF BOOKS

Green's Manual of Pathology

Fifteenth edition. Revised by H. W. C. VINES, M.A., M.D., Pathologist to Charing Cross Hospital, London. London: Baillière, Tindall and Cox. 1934. Pp. 928. 25s.

BROUGHT out first more than sixty years ago, and with a new edition on the average every four years, "Green's Pathology" has enabled countless medical students to meet the needs of the qualifying examiner. It was not, and is not, intended for research workers or for post-graduate study in pathology; the aim of successive editors has been to give the student some insight into the processes of disease. The present edition has been largely rewritten by Dr. Vines, who has added many new illustrations and replaced many of the old ones by photographs. Additional chapters have been introduced dealing with avitaminosis, diseases of the ductless glands, the generative tract, and the breast. The original arrangement of the work into two parts, one dealing with general principles, the other with the special pathology of organs, has been retained, but in other respects the order has been considerably altered by the present editor. For the most part these will help the student, but we have a misgiving about dealing with inflammation before the degenerations. It seems to us more rational to dispose of the purely retrogressive changes in pathology before attacking the progressive ones; teachers are aware that retrogressive cell changes are on the whole more easily demonstrated histologically to the beginner than the somewhat complicated cytology of inflammation.

There may be just a doubt whether the book has not now reached, or indeed somewhat overpassed, the limits of the medical student's capacity. There is perhaps a tendency in this edition to strive unduly after comprehensiveness and to lose balance by so doing. Hitherto the student has been guided in the direction of the fundamentally important sections by finding these dealt with at greater length than the others. Teachers may well differ on the relative importance of subjects, but silicosis, which is described incidentally in various parts of the book and briefly under lung diseases, might have been given a section to itself. Chronic nephritis, the importance of which to medicine cannot be denied, has hardly been given due weight, and Russell's classification, however valuable as a contribution to pathology, is not the clearest way of imparting to the student an idea of the sequence of events in the nephritic process. In dealing with pulmonary embolism no mention is made of the possible origin of emboli in the leg veins, which is regrettable when so much depends on drawing the student's attention to the dangers of post-operative swelling of the leg.

In its present form the manual will find, and deserve to find many new friends.

Morality and Reality

By E. GRAHAM HOWE, M.B., B.S., D.P.M., Associate Physician, Institute of Medical Psychology. London: Gerald Howe. 1934. Pp. 136. 6s.

THIS little book, which the author puts forward as "An Essay on the Law of Life," is made up of five lectures delivered for the Home and School Council; consequently the style is familiar, though not always easy. The book presents conclusions about the widest relations of human beings to the world, reached by the author in the course of his work as a psychotherapist. Morality and the nature of things have engaged the lifelong attention of the greatest thinkers, and some may hold that the production of an essay with such an ambitious title is an over-bold excursion into the realms of philosophy. But the polished systems of trained moralists are for many readers less likely to be of interest than the struggles towards a *Weltanschauung* of an individual whose training is that of a doctor and whose daily work is the treatment of neurotics. His contact with the problems of what is right and what is real in the world almost demands that he should form a working system for himself. Dr. Howe's system is now somewhat remote from its beginnings and basis; it has religious and mystical features and is presented here in a form in which its derivation from medical practice is no longer evident. This doubtless accounts for the difficulty and the occasional obscurity of his language, which is, however, lightened by a vigorous use of odd illustrations and original words—e.g., "oughty" and "escapologist," and by some diverting symbolical diagrams. In the first lecture the Good and the True are considered in relation to the Law, in the second Law and the Child, in the third Law and the Family; Law and the Social Group, and the Fulfilment of the Law are the titles of the concluding lectures. The book as a whole shows in an illuminating way the tendencies inherent in the theory that underlies much present-day analytical psychotherapy.

Early Forerunners of Man

A Morphological Study of the Evolutionary Origin of the Primates. By W. E. LE GROS CLARK, D.Sc., F.R.C.S., Professor Elect of Anatomy, University of Oxford; Professor in the University of London. London: Baillière, Tindall and Cox. 1934. Pp. 296. 15s.

IN this book Dr. Le Gros Clark brings together the anatomical evidence bearing on the vexed questions of anthropoid ancestry, for the justification of the main title lies in the inclusion of man in this group of the order of primates and not in any consideration of him as a species. It is a well-written work of very great interest, in which the author considers the relative positions of the groups with which he is dealing from the combined points of view obtained by reference to several anatomical systems. Skull, teeth, limbs, brain, special senses, digestive and reproductive systems are all examined with this idea in mind. His researches lead him definitely to certain conclusions, which appear to be reasonably based on the available evidence. The positions of the tarsioid and lemuroid groups are important questions; Prof. Le Gros Clark is decidedly of the opinion that the protolemuroids must have branched off from the less specialised line at a very early stage, so that it is probably not legitimate to speak of a "lemuroid" phase in the development history of the anthropoides. He seems also very certain that the tarsioids did not linger much longer in the generalised line, since their structural specialisation appeared very early. He comes, in fact, to agreement with Hans Gadow's proposal to place tarsius in a central sub-order of the primates, with no connexion beyond a remote ancestral one with the

anthropoids. There is a most interesting chapter on the tree-shrews, which the author would seem disposed to place among the primates—a sort of remnant from the time when protolemuroids and prototarsioids were separating from each other. The book is full of interesting detail, put simply and clearly. It brings out very well the parallelisms which obtain in the evolutionary history of the primates, as in other orders, characters which are referred for explanation to the principles of orthogenesis; this, however, is not pushed to its logical conclusion. Driven by the nature of his material, Prof. Le Gros Clark deals largely in assumptions, but these are kept in accordance with facts.

Each reader, doubtless, will have his own views on the many questions of evolution, but whatever these are he will derive both pleasure and profit from a study of this volume.

Applied Physiology

Fifth edition. By SAMSON WRIGHT, M.D., F.R.C.P., John Astor Professor of Physiology, University of London, Middlesex Hospital Medical School. London: Humphrey Milford, Oxford University Press. 1934. Pp. 604. 18s.

THE teaching of physiology has lately suffered from the criticism, applied also to other subjects in the medical curriculum, that the student is made to learn a great deal which is of "no use" to him in his future work. This arises from a false sense of values which Prof. Wright's book should go some way to correct. Here numerous facts of physiology are presented, reference being continually made to their application in medicine and surgery; anyone engaged in clinical study or teaching might be pardoned for regarding it as the perfect text-book of physiology. It is up to date, and contains many facts difficult to find elsewhere; if the student knew everything in these 600 pages he would know more than sufficient from the point of view of immediate utility. Yet this is emphatically not the book for the student reading for his second professional examination. It is too often forgotten that he comes from his pre-medical courses knowing virtually nothing about the body; in the short period of 18 months or so he has to learn a completely new language so thoroughly that in his subsequent work he thinks in terms of nothing else. This volume assumes a working knowledge of the language which it is the primary task of the physiologist and anatomist to teach, and the time when it should be added to the bookshelf is just before or just after the second examination. The student is now possessed of the necessary fundamental knowledge, and his critical faculties have been awakened; he requires orientation. Strictly speaking, "applied physiology" is medicine or surgery or midwifery, but Prof. Wright has gone far to create a new transitional subject, and his book is alike valuable in introducing a new point of view and in serving later for reference.

Its unsuitability for the uncritical reader is indicated on the fly-leaf where there is a quotation from the Book of Proverbs: "The simple believeth every word; but the prudent man looketh well to his going." The long list in the preface of subjects which have been revised indicates not only that the matter has been conscientiously brought up to date, but that nothing in the text must be taken as the final word. The book is written—no doubt in the interests of clarity—in a rather dogmatic fashion, the matter being presented where possible in tabular form. There is no harm in this for the reader so long as he does not mistake crisp style for certain knowledge. Controversial subjects are avoided or provisionally prejudged, and there is little discussion of the pros and cons of experimental evidence; this is compensated by introducing in successive editions the most recent work in all parts of the subject, and by the gain in continuity. The treatment of the nervous system is excellent; the anatomical tradition is broken, and the approach made physiological. This might well serve as a pattern for all text-books of physiology.

The fact that this book has run into five editions in a comparatively short time is in itself eloquent testimony to the place it has taken in medical education. Its general appearance is attractive, the illustrations are numerous and often original, the index is full and supplemented by cross-references in the text.

Coccidia and Coccidiosis

Of Domesticated Game and Laboratory Animals and of Man.

By ELERY R. BECKER, D.Sc., Associate Professor of Protozoology, Iowa State College. Iowa: Collegiate Press, Inc. 1934. Pp. 147.

COCCIDIOSIS has, during recent years, attracted considerable attention, chiefly on account of its bearing on the successful rearing of domestic animals. As a result there has accumulated much valuable information, which is, however, difficult of access since it is scattered in innumerable journals. Intensive study has revealed an unexpected multiplicity of species in some animals—for instance, in the fowl the two species previously recognised have now been extended to six. Similar results have been obtained with other animals such as cattle, sheep, and pigs, and it is becoming clear that each host has its own group of coccidia, which are highly specific in that they are unable to infect any other kind of animal. Each species is not only morphologically, but also immunologically and pathologically distinct, so that a fowl, for instance, would have to suffer from six separate infections if it were to become entirely immune to coccidiosis. Attempts have been made without success to discover drugs which will overcome coccidial infections or prevent them, while efforts have been made by careful hygienic measures to rear animals entirely free from contamination. It has been found, however, that as a rule the best results from the practical point of view of breeding are obtained by allowing a mild infection in the very young animals, a procedure which produces an immunity to what might be a more serious infection later in life. It is fortunate that coccidiosis in man is relatively rare, while the parasites of many animals are merely of zoological interest. This book is very complete, describing all the known species, lists of which, together with their hosts, are given in appendices. Each parasite is considered, so far as existing knowledge permits, from the various points of view noted above, special stress being laid on the effect on the hosts and the lesions produced. There is a sufficiency of good illustrations and a very useful list of references to literature.

The book should be in the hands of all those who are interested in the subject of coccidiosis, whether from the purely zoological point of view or that of the intelligent animal breeder.

THE LANCET

LONDON: SATURDAY, AUGUST 18, 1934

THE DEATH PENALTY AND THE PUBLIC

THE issue of a new journal, the *Penal Reformer*,[1] is fresh evidence of the feeling of many citizens that hanging is an obsolete and unjustifiable punishment. Its abandonment, they hold, should not be postponed till the advent of some general revision of criminal justice and prison administration; and in this they can point to the recommendation of the Select Committee on Capital Punishment which in 1930 advocated abolition of the death penalty for an experimental period of five years. It was unfortunate that, owing to dissensions and abstentions, the Select Committee's report was to some extent discounted as a one-sided statement, since apart from its conclusions it was valuable for its considered summary of the case for and against. Whether the true theory of punishment be the vindictive doctrine of the *lex talionis*, or the principle of atonement, or the security of society, or simply the reformation of the offender, well-known arguments against the gallows can be based on the sanctity of human life, the non-deterrent effect of hanging, the fallibility of human decisions, and the failure to offer reformative opportunity to murderers who are not necessarily hardened criminals. The abolitionists, however, are not all agreed on a practical policy. Dr. MAURICE HAMBLIN SMITH, whose long experience as a prison medical officer entitled him to speak with special authority, told the Select Committee that he deprecated treating the question as separate from other changes in the penal system. His broad view of the administration of justice led him towards the position that all crime was a disease and that offenders should be dealt with by boards containing psychological experts, though not exclusively medical in their membership. Mr. ALEXANDER PATERSON, one of the Prison Commissioners, a witness whose humane outlook no one would venture to attack, suggested that there should be a reduction in the number of executions—a sort of de-facto abolition which would prepare a conservatively minded public for legal abolition. Obviously, however, he was dissatisfied with the alternatives to hanging. Indeed, he declared that he regarded a sentence of imprisonment for more than ten years as less humane than the death penalty.

It may well be said that we are moving towards some such system of de-facto abolition as Mr. PATERSON advised; and on the long-term view there are notable stages of progress. It has been estimated that 2000 people were executed annually for criminal offences in the reign of Henry VIII. and 400 in that of Elizabeth. In the ten years from 1920, on the other hand, the average number of capital sentences carried out was 14, and the latest available return (for 1932) shows that of 10 persons convicted of murder, 4 were executed and 6 had their sentence commuted to penal servitude for life. The prerogative of mercy, in fact, mitigates the severity and finality of the criminal law. The *Penal Reformer* is able, nevertheless, to print a depressing list of persons hanged since last November, while its summaries of the defences proffered might even suggest that there was room for doubt about the guilt of some of the executed. As to the risk of such a miscarriage of justice, Dr. HAMBLIN SMITH told the Select Committee that he did not see how, regard being paid to human fallibility, more care could be taken than the law takes at present. He would not entirely exclude the possibility; yet he added the hard saying that, if capital punishment is deemed desirable for other reasons, he would not allow the prospect of judicial error to weigh against it: "if you really thought it was the best form of deterrent, then I would not allow the possibility of the occasional execution of an innocent man to stand in the way." He thought, as others think, that it is the certainty rather than the gravity of the punishment which deters. The reformers, however, are not prepared to concede that, in the case of murder, the hand of the intending criminal is stayed by any deliberate study of the penal clauses of our criminal code. In their view the experience of other countries shows that the death penalty can be abolished without danger.

Death, we shall all agree, is the simplest solution of the problem of the criminal and from his own point of view is sometimes no doubt the happiest. But there are many other people whose advantage and disadvantage must also be borne in mind. Apart altogether from friends and relatives, or prospective criminals, there is the public at large. The form of execution which is used is calculated to inspire horror; and this horror is nowadays so fully exploited by the press that half the population has its emotions roused by dwelling on the murderer's ordeal. If, as we are assured, little more than 30 people have been executed since the Select Committee reported in 1930 one can only say that the newspapers have made these few executions go a very long way. There seems to be an almost continuous performance of the familiar sequence: the scene in court at the sentence; the protestations of innocence; the collapse of wives and children; the pathetic letters; the petition; the refusal of a reprieve; the last reported emotions; the hanging (at breakfast time); the unpleasantly excited crowd waiting for the notice at the prison gates; and the posters ("So-and-so Executed") in every street. Times have changed, it is true, since a hundred years ago when the first railway excursion was run in England—to see a double hanging. Indeed to most of our own generation such an outing would seem indecent, just as it would seem indecent to open slaughter-

[1] Published quarterly by the Howard League for Penal Reform and the National Council for the Abolition of the Death Penalty, from Parliament Mansions, Victoria-street, London, S.W.1. 3d.

houses as places of public amusement. But the fact remains that the sufferings of murderers and their families are still used for public entertainment, and the sadistic element which is to be found in everyone, normal or abnormal, is regularly exploited in this way, in the name of the State and for the sake of large circulations.

ECLAMPSIA AND ANTENATAL CARE

ROUTINE antenatal care was first advocated by J. W. BALLANTYNE of Edinburgh. It is more than 40 years since his "Attempts towards a System of Antenatal Pathology" began to appear, and on this his scheme of care was to be based. Discussion (reported on p. 379) at the recent annual meeting of the British Medical Association indicates that the system of antenatal pathology is still far from complete, and that many of the good results which BALLANTYNE anticipated from his system of care have not been achieved. He looked for a fall in the maternal death-rate from sepsis, hæmorrhage, and embolism, and expected earlier treatment of toxæmia, syphilis, and heart disease. But though some of these hopes have been fulfilled, the maternal death-rate has remained stationary. There are limits, of course, to what antenatal care can do; as Prof. F. J. BROWNE has pointed out in our columns,[1] it cannot be expected to influence the death-rate from post-partum hæmorrhage or from shock after easy uncomplicated labour. The number of deaths from obstructed labour due to disproportion might fairly be expected to diminish, and indeed they are becoming rarer, but he thinks that in many cases the diagnosis of disproportion has led to unwarrantable interference: "It does not help a woman very much if she is rescued from the hypothetical consequences of an abnormality, and is killed in effecting the rescue." In these cases, he thinks, antenatal supervision has simply transferred the mortality from one column to another. A serious criticism of the present system of antenatal care is to be found in our failure to reduce the death-rate from toxæmia. True the rate has decreased in the past two years from 0·69 to 0·58 per 1000, but, as Prof. BROWNE remarked at the B.M.A. discussion, considering that eclampsia is almost entirely a preventable disease, the incidence and death-rate are still far too high. Dr. ETHEL CASSIE presented the findings at a Birmingham maternity home where the standard of antenatal care is exceptional; out of a series of 1000 consecutive cases, 26 per cent. were admitted for the antenatal treatment of conditions such as heart disease, pyelitis, and toxæmia, yet the mortality-rate was only 1 per 1000. In New Zealand the figures are still more remarkable. It is well known how high has been the maternal mortality of childbirth in that Dominion of recent years, and yet among the first 1000 deliveries since the establishment at Otago of a whole-time chair of obstetrics (with antenatal clinic) not a single mother died.[2] This indicates, Dr. CASSIE considers, that where the standard of antenatal care is satisfactory maternal mortality is reduced. To detect toxæmia in its early stages supervision must be close and continuous. Dr. CASSIE contrasted the findings at this maternity home with the results of an inquiry into the maternal deaths in the whole of Birmingham during the past five years; of 88 patients dying of toxæmia, 64 had too little antenatal care or none at all. Attendances at antenatal clinics are increasing, but many of the patients attend only once or twice. Dr. G. F. BUCHAN suggested that when a mother failed to keep her appointment an inquiry should be made at once at her home; she might have failed to attend because of a physical condition calling for immediate treatment. This is not always easy to arrange, as Dr. CASSIE explained; if the patient is not amenable the midwife cannot give effective supervision. Nevertheless, regular antenatal care is essential if early signs of toxæmia are to be detected.

One of the earliest indications of the pre-eclamptic state is a rise of blood pressure, yet this is a sign which the midwife of to-day does not know how to observe. It is Prof. BROWNE's hope that the midwife of the future will be trained to estimate the blood pressure, and that public health authorities will provide her with a simple apparatus for the purpose. It is not difficult to take a blood-pressure reading; the difficulties in the way, formidable no doubt, are of a purely administrative kind. Another early sign of toxæmia was mentioned by Dame LOUISE MCILROY in her Ingleby lecture, published in our last issue. She quotes the work of DAVIS, HARDING and VAN WYCK, BINGHAM, and others, showing that a sudden gain in weight in the latter part of pregnancy is significant of water retention in the tissues, and is an earlier clinical sign of toxæmia than œdema. The normal gain in weight during pregnancy is between 16 and 20 lb.; heavy women gain more than light. As a rough rule, it may be said that if a heavy woman is gaining more than 2 lb. a month, "latent dropsy" should be suspected, and she should be carefully watched. The increase of weight in BINGHAM'S cases preceded not only the appearance of albumin in the urine, but the rise of blood pressure, so that this constitutes a valuable sign which anyone engaged in antenatal work can observe. Weekly weighing should be a routine measure.

Notification of eclampsia would possibly lead to earlier discovery, as Prof. BROWNE suggests. Certainly fuller records of every case, as advocated by Dr. BUCHAN, would lead to a better evaluation of the known facts. A hopeful promise of prevention is offered in Prof. MCILROY'S concluding lecture, which appears on p. 345. She recommends for pregnant women the diet proposed by Mrs. MELLANBY, consisting of milk 1–2 pints, green vegetables once or twice daily, 1–2 eggs daily, sea fish—for the iodine content—at least twice weekly, and calf's liver once a week. For the rest the patient can choose her own diet, provided she does not over-eat. Prof. MCILROY'S statement, "that most of the toxæmia of pregnancy can be

[1] THE LANCET, 1932, ii., 3.
[2] Report by Prof. J. B. Dawson. Dunedin: Crown Print. 1934.

prevented by a suitable mixed diet," is instructive. In mothers who are gaining excessive weight restriction of the diet is beneficial. Heartburn, Prof. McIlroy finds, is sometimes an indication of impending toxæmia, and is relieved by giving small dry meals with a low fat content. Hypertension, which is frequently present in toxæmia of the renal type, usually reacts quickly to treatment of the general condition, but she does not advise specific attempts to reduce the blood pressure by means of drugs. Hypertension probably has a protective function, though we look upon it as a warning sign. A sudden reduction of blood pressure by the use of drugs may precipitate heart failure.

THE SIGNIFICANCE OF GLYCOSURIA IN LIFE ASSURANCE

A discussion was held recently by members of the Insurance Medical Society upon the importance which should be attached to glycosuria and blood-sugar curves in relation to the duration of life. The speakers debated mainly the policy to be adopted by life assurance offices towards applicants who manifest these symptoms, and the discussion illustrated well the changes which have taken place comparatively lately in medical knowledge, while indicating also the difficulties which remain to be overcome. Dr. Batty Shaw, who opened the discussion, said that in the past cases of glycosuria had been shunned by life assurance companies, but that recently a change of opinion had occurred. Some companies would accept healthy patients with occasional glycosuria at normal rates, while others rated them up. If the glycosuria occurred intermittently most of the cases were rated up, and cases in which glycosuria was always present were usually rejected. This policy he held to be in error, for his own figures showed that out of 865 accepted cases in which glycosuria had occurred intermittently before acceptance, 49 had died, and only seven of them from diabetes mellitus. In many cases the patients had been rated up because of the glycosuria. Mr. N. J. Carter had stated that the Eagle Insurance Company had accepted a certain number of cases of glycosuria since 1917, and, while there had been 30 deaths from diabetes among the insured subjects since this time, only one of these had had glycosuria at the time of his original examination, and he had been accepted as a known diabetic; and, further, no patient with mild glycosuria without symptoms of diabetes had died of diabetes in the last 17 years. Figures given by Dr. Theodore Thompson from the Royal Insurance Society were equally striking, as between 1908 and 1933 no deaths occurred from diabetes in cases where there was a personal history of glycosuria.

It has been known since the work of Klemperer in 1896 that glycosuria might occur even when the blood-sugar was normal. The observations were made on isolated blood-sugar estimations, as it was not realised until the work of Jacobsen in 1913 that the blood-sugar increased after a carbohydrate meal. In 1915 Graham, working on two of Garrod's cases, showed that the blood-sugar was always within normal limits although sugar was present in the urine to the extent of 4 per cent., and 20 g. of glucose were excreted in the 24 hours when an ordinary diet was taken. In the last 19 years the existence of a renal glycosuria has been fully established by numerous workers. The amount of sugar excreted may be quite small 1–5 g., or large, 10–30 g.; it may only be present after meals, or it may be present in every specimen. The amount of sugar depends on whether the threshold of the kidney is only slightly lowered, say to 150 mg. per 100 c.cm., or is lower than 80 mg. per 100 c.cm. The sugar-tolerance test, which has made the recognition of this syndrome possible, has been closely studied and the results are sometimes difficult to interpret. During the debate, Embledon, Cammidge, Himsworth, Langdon Brown, H. W. Collier, Parkes Weber, and Graham discussed the difficulties which might be encountered and the mistakes which must be avoided in order to give a sound opinion on a sugar-tolerance curve. It was agreed that it is essential that the kind of blood which is used for the estimation should be stated. Capillary blood gives figures which may be 25, 50, or over 70 mg. higher than the venous blood, at the peak of the curve. The quotations from a paper by Dr. Rabinowitch, read by Dr. Collier, lose much of their significance when it is realised that he worked with venous blood. The method used in the estimation of the blood-sugar should also be stated, as the Folin and Wu method gives figures which are 20 mg., on average, greater than those obtained with the Hagedorn-Jensen and MacLean methods. The patient's diet must also be considered. If the patient has either been starved or received a low carbohydrate diet, sufficient to produce a ketosis, the blood-sugar curve may be higher than usual and suggest that the patient has a low sugar tolerance. If the test is repeated after a high carbohydrate diet has been taken for a few days the curve may be quite normal. The majority of workers agree that the fasting blood-sugar should be less than 100 to 120 mg. per 100 c.cm. and should have returned to 120 mg. within two, or some say three, hours. The actual height of the peak seems to be immaterial, provided that the blood-sugar is below 120 mg. in the two hours. This is best instanced by the curve called by MacLean the "lag curve," or by Spence the "steeple curve." Abnormal curves may be caused by disturbing factors, and Dr. Batty Shaw gave instances where an overdose of thyroid extract or a subacute attack of cholecystitis had caused curves which would be interpreted as being due to a definite diminution of sugar tolerance. It is wrong to test the sugar tolerance of a patient when he is suffering from any disease, as the disease may cause a glycosuria. The best-known instance of this is the glycosuria which may occur when a bad carbuncle is present; in these cases the sugar tolerance may be quite normal when

the carbuncle is healed. However, there still remain some curves which are difficult to interpret, and one way of settling the matter is to use the method which GRAHAM used in confirming the diagnosis in his first cases of renal glycosuria. This method is well described by LEYTON in his book, "Diabetes Mellitus," recently reviewed in our columns[1]; it consists in giving the patient increasing amounts of carbohydrate to eat and seeing how much sugar is excreted.

Those who have worked on sugar-tolerance curves believe that patients with a renal glycosuria or with a typical lag curve should be accepted at the usual rates, provided there are no other contra-indications; the patients with doubtful curves may have to be re-examined in three months' time, and if the curve is then normal should be accepted at normal rates. They believe that it is unwise to accept a patient who has glycosuria unless a sugar-tolerance curve is first obtained, because some patients with mild true diabetes may have no symptoms for a little while after the onset of the glycosuria. Some of the insurance societies, however, find that patients dislike having to undergo a special test, and Dr. OTTO MAY suggested that as patients with occasional glycosuria rarely died of diabetes they might be accepted at normal rates or with only slight rating. He suggested as a working rule, "(*a*) occasional intermittent glycosuria and no symptoms—accept with slight extra; (*b*) persistent glycosuria and no symptoms—a moderate extra; (*c*) frank diabetes, i.e., glycosuria with symptoms—reject or a very large extra." This policy might suit the insurance societies but it would be unfair to the patients with renal glycosuria, who would fall under class (*b*) and would pay a moderate extra rate. The early cases of diabetes which are detected by the sugar-tolerance curve would pass undetected and only pay a moderate additional rate whereas they should pay a heavy rate.

The discussion was of great importance in showing the value of the sugar-tolerance test and also the care which must be taken in any biochemical test in order to prevent misleading reports. It is to be hoped that the insurance societies will continue to use them instead of reverting to rule-of-thumb methods.

PREVENTION[2]

A VOLUME setting out the principles of prophylaxis appears this week, being the second in the post-graduate series issued by THE LANCET. The work is composed of a series of lectures delivered at King's College Hospital Medical School, where the dean and the director of medical studies, by instituting the course, show themselves to have appreciated in a practical manner the growing feeling that the preventive aspects of medicine do not receive the attention that they should, while in educational curricula the importance attributed to them compares sadly with that which is given to clinical work. Sir GEORGE NEWMAN in the first chapter of the book expands his already expressed opinion that the doctrines of prevention should permeate the whole of the student's preparation, and points out that in the revision of medical training, now receiving the attention of the General Medical Council, the preventive side of medical work must be brought forward in a more emphatic manner than hitherto.

It is of the first importance that the mind of the student should be focused throughout his educational career upon the doctrines of prevention—in other words, that he should see from the beginning that it is the duty of the doctor to help his patients to maintain health as well as to regain it. But it will be recognised that all doctors, when faced with facts in their professional careers, act with this view fully before them; they have obtained hitherto from the public little endorsement of such a view. The patient comes to the doctor when he is ill, and often not until the time has gone by when relief from his troubles could have been obtained promptly, or—which is more vital—when permanent recovery could be established. To tell him that if he had lived a different life he might have escaped his present ordeal is felt to be an aggravation of his troubles, and counsel on the matter has been proffered only when a recurrence of the troubles might be expected. But to-day the situation is altered quite distinctly. The sick man himself may not, at any rate while he is suffering, reflect with any particular interest upon questions of prophylaxis, but the circle around him will do it for him and sometimes vociferously. For of recent time the public is aroused to knowing that much of the disease which persecutes us is preventable, and the doctor who can assist in this wholesome awakening finds his words welcome. And his ready audience will typify the modern attitude of all intelligent people. There is with us now a general demand for codes of healthy living, which if the doctor is not prepared to supply, the public will seek from sources less reliable. The first step to meet the demand must be to demonstrate to the sceptic among doctors that there are facts about preventive medicine which are established, and which cover—even when unsupported theories and fads are rigidly excluded—a considerable area of ground of which a map should prove useful. It is true that most, if not all, of these facts are individually familiar to the doctor, but it is not until they are collected that their cumulative weight becomes evident.

The authorities at King's College Hospital were fortunate in securing the excellent coöperation exhibited in this volume; the information afforded by persons of responsibility will enable the doctor to educate his environment on questions of vital hygienic importance. As is said in the preface of the book, the map of prophylaxis, which its pages form, "makes no pretence to be complete, but since each region is surveyed by a recognised

[1] THE LANCET, July 21st, p. 141.
[2] A series of lectures on the Preventive Aspects of Medicine. Published by THE LANCET LTD., 7, Adam-street, Adelphi, London, W.C.2. 10s. 6d.

authority, often by the original explorer, a vivid outline of the charted country is supplied." The survey shows what effective progress has been made in many directions which enable the doctor to exercise intelligent anticipation of evils to come, and to solve for the public understanding many of the doubts that exist as to the methods of conducting a healthy life.

ANNOTATIONS

THE COD-LIVER OIL TREATMENT OF WOUNDS

Two years ago at a surgical congress in Magdeburg, Prof. Wilhelm Löhr reported on the value of crude cod-liver oil in the healing of wounds. Applied to ulcers, burns, in fact any kind of abraded surface, followed by immobilisation of the part with a plaster bandage, the results were then very striking, and his subsequent experience at the Altstadt Hospital has only been more remarkable. Before he came to Magdeburg Löhr was a biologist, and it was as a biologist that he was first impressed with the effect of cod-liver oil given internally on the healing of wounds in children. He began to apply the crude oil to granulating surfaces, and noted the changes which went on underneath it. He was already aware that, like other oils, cod-liver oil is practically sterile and has some bactericidal action on the common pyogenic organisms. The oil proving too mobile for use alone he combined it with some indifferent fat to make an application of the right consistence,[1] which was found rapidly to permeate granulation tissue forming an emulsion with its secretion. Under this layer he discovered that bacterial growth was hindered and bacterial toxins rendered harmless. The practical result of applying this cod-liver oil salve to a mass of granulations is to change a pale oozing surface covered with detritus into the clean ruddy picture of healing. Tremendous activity with massive secretion of pus soon leads to the shedding of dead tissue and sharp demarcation between the healthy and dead. So violent is this action that it may be inadvisable at this stage to shut it in with an impenetrable layer of plaster, although this should be done as soon as it is safe to do so. On the other hand, the comparatively bacteria-free wounds of industry, common enough in the iron industry at Magdeburg, can safely be covered at once with a layer of oil and immobilised in a plaster bandage, when in this warm chamber healing of the almost sterile wound proceeds at an amazing speed. Any part in which the circulation is relatively deficient, as in chronic ulcers of the leg, can be treated with the occlusive bandage at once. The time of its application is regulated by the acuteness of the infection. Phlegmons and abscesses must first be laid open with the knife; in whitlows and infections of tendon and bone the opportunity must first be given for removal of the dead fragments. But in recent injuries of the fingers and burns of the second degree the immediate application of the occlusive oil bandage results in rapid healing without need of transplantation of skin. During the last three and a half years in the Altstadt no burnt surface has been sown with transplants, even though the epithelium has been destroyed over a surface as large as the back, and one doubts whether such success has attended any other method. Amputation stumps and the open wounds left after removal of a breast cancer with the diathermic knife are equally suited for the treatment, which can also be applied to dirty brain wounds and accidental bed-sores.

An additional claim for the treatment is that it is practically painless, and anyone who accompanies Löhr on a round through the wards can satisfy himself that this is the case. On the other hand there is a drawback which he does not seek to evade, and that is the aroma arising from wounds on which the dressing is left unchanged for days or weeks. The smell will be not unfamiliar in kind, if not in degree, to those who have followed Winnett Orr of Nebraska in treating compound fractures and other septic wounds of bone with a similarly occlusive dressing.[2] This may be unavoidable if, as Löhr believes, the physical properties of an oil are an important element, but it must make medical and nursing work in such wards a trial for those with sensitive noses. Remarkable success is claimed in acute osteomyelitis, which Löhr treats with free incision down to the periosteum combined with drilling or chiselling of the bone. The whole wound is then filled up with the cod-liver oil salve, the edges being brought loosely together with two or three stitches. No drain of any kind is inserted, the oil serving to keep the wound open until it has healed from the bottom. The first plaster bandage is left on for a fortnight and as a rule no sequester is then found. It remains to be seen whether the results are better than those of the Winnett-Orr method, of which painlessness is also a feature[3]; in the meantime they are such as to command respect and lead to imitation. Those who cannot see them for themselves will find a series of admirable pictures in recent published papers.[4]

[1] The salve has been put on the market by Heyl & Co., Berlin, under the name "Unguentolan."

X RAY TREATMENT OF ACTINOMYCOSIS

ACTINOMYCOSIS may be treated with iodides, by surgery, by irradiation, or by a combination of methods. Some form of surgery is often required; it may be no more than aspiration to establish the diagnosis or it may be an extensive and even mutilating operation undertaken in hope of extirpating the disease. The results of such operations are often highly unsatisfactory and the question arises how far X rays may be effective as an adjuvant or an alternative. Although much success has been reported with irradiation, its use is complicated by the fact that actinomycosis, if it is to be cured, requires a dose that approaches the maximum that the skin will tolerate. The problem has been to evolve a technique which will give certain cure without too much damage. The results are much more hopeful in cases of infection of the head and neck—e.g., jaw, face, tonsil, cervical glands—than in actinomycosis of lungs, liver, or intestine. R. Stewart Harrison,[5] in describing the various methods available, offers his own experience of two of them. The "saturation" method consists in giving a very large initial dose, approaching the maximum possible, and following this by two or three very much smaller ones at intervals of, say, two or three days each. H. Holfelder (whom he quotes) has reported 100 per cent. successes with this technique. In the

[1] THE LANCET, 1933, ii., 357.
[2] Ibid., 1934, i., 530.
[3] Illustrating Burns: Der Chirurg., 1934, vi., 263. Injuries of Hand and Foot: ibid., 1934, vi., 5. Gas Œdema: Arch. f. klin. Chir., 1934, clxxix., 312.
[4] Brit. Jour. Radiol., 1934, vii., 98.

"disjuncted fractional" method, approximately the same dose is given, but in fractions with intervals between doses of one week to a month, so that the whole course may last six months. Harrison adopted this in 14 cases of actinomycosis of the head and neck that came under his care, and the results were uniformly good; but, as he found it necessary to use a high initial dose, the extent of the skin reaction was very considerable. This took the form of telangiectasis or pigmentation, and although lessened by a reduction of the initial dose, was not altogether avoided thereby. Massive initial doses can also produce a severe œdema and swelling locally that may cause dysphagia or dyspnœa. In the last 8 cases of actinomycosis of the head and neck that he had to treat he therefore tried a "protracted fractional" technique in which the massive dose is dispensed with and permanent skin changes do not occur. As he points out, the advantage here, apart from avoiding a scar, is that if the first course of treatment is not entirely successful, the chances of subsequent treatment by X rays are not destroyed by skin changes. In the protracted method a sufficient dose has been applied in a series of 4–10 irradiations given on successive days, and instead of weeks or months it takes only a matter of days. Of the 8 patients thus treated, 7 now show no signs of the disease and the eighth died of another malady. In the cases of actinomycosis of the internal organs, however, the results have not been so good. Harrison reports only on cases treated by the disjuncted fractional method, and these (8 in number) have all been unsatisfactory. He hopes to get better results by the protracted fractional technique. Iodides are largely used in the treatment of actinomycosis and Harrison thinks them useful in combination with other forms of treatment, but not likely to bring about a cure by themselves.

THE BRONCHIAL MUSCLE IN ASTHMA

After a careful investigation of the intrinsic nerve-supply of the human lung, Dr. J. B. Gaylor,[1] of Glasgow, makes suggestions as to the functional significance of his findings. Perhaps the most interesting of these refers to the sensory nerve-endings (almost certainly vagal) which he and other observers find in the bronchial muscle. He points out that this muscle is not a continuous sheet, but arranged in more or less circular and oblique branching bands with spaces between, so that on contraction it must shorten as well as constrict the bronchi. Conversely, when the lungs are stretched in all directions by inspiration, the muscle must also be stretched both by the lengthening and the dilatation of the bronchi. The sensory endings lie chiefly at the junctions of the muscle bands and are very numerous where a bronchus branches; exactly similar endings are found in the carotid sinus, and the only stimulus which these two structures can have in common is that of tension. Gaylor suggests that the Hering-Breuer reflex, which brings about expiration when inspiration has reached a certain pitch, originates in stretching of the muscle bands and stimulation of these endings. In asthma, supposing the bronchi to be tonically contracted, the adequate degree of stretching in the muscle would not be attained until inspiration had exceeded its normal range, so that it would be unduly prolonged, as is actually the case, and expiration would be delayed. Once expiration had been initiated, the bronchi would tend to close down and obstruction would be particularly marked where branching occurred. This theory of asthma is incomplete, however, since it takes no account of the reverse phase of the Hering-Breuer reflex—namely, the initiation of inspiration when expiration reaches a certain pitch. Following the same argument, the stimulus for this should be shortening of the bronchial muscle, and inspiration should recur shortly after expiration has started. It is, of course, possible that some such nervous disturbance may contribute to the difficulty in expiration, but the whole theory is speculative and additions to it are hardly justified. For instance, sensory fibres also end in the epithelium, and while admittedly muscle stretch is more likely as an adequate stimulus, there seems nothing to disprove the possibility that the passage of air over the mucosa in some way initiates the Hering-Breuer reflex. Whichever set of sensory endings is chosen for the reflex, there is some difficulty in accounting for the function of the other; the balance of probability lies on Gaylor's side since he very reasonably supposes that the epithelial endings might subserve the cough reflex; their arrangement is such that they would be strongly stimulated by stripping of the epithelium. Local reaction and secretion, and possibly bronchial peristalsis, he believes to be brought about by axon reflexes for which there is ample provision. It should be emphasised that the paper in the main is an account of painstaking histological research, any appreciation or criticism of which would necessarily be of a technical nature. The more generally interesting and controversial physiological applications are advanced incidentally.

[1] Brain, 1934, lvii., 143.

LICIT AND ILLICIT TRAFFIC IN DANGEROUS DRUGS

At its latest meeting—the eighteenth of the series—the Advisory Committee of the League of Nations on Opium and other Dangerous Drugs reviewed the whole situation as regards international control. The main features of this situation are a progressive shrinkage in the production and distribution of the drugs for legitimate commerce, and a disquieting increase in the clandestine manufacture and traffic in opium, its derivatives, and other narcotics. A novel feature was disclosed in a process, discovered in Hungary, by which the opium alkaloids can be extracted direct from the dried poppy plant (poppy straw), without passing through the intermediary stage of raw opium. By this means morphine can be extracted from the poppy straw, which has previously been wasted, such morphine being capable of competing favourably with that derived from raw opium. This discovery is calculated to exert considerable influence on the future manufacture of opium alkaloids, and it was resolved by the advisory committee that the question, in all its bearings, should be discussed at the next session, in November of this year. A memorandum prepared by the secretariat of the League gave the average annual world-production of raw opium, for the years 1928–32, as 1385 tons. Moreover stocks, amounting to 3000 tons, were held at the end of 1932 in the various countries, excluding China. The producing countries, like Persia, are accordingly seeking new markets; others may conclude that the need for the promised limitation of production of the raw materials is strongly emphasised. Reference has already been made in our columns to the highly unsatisfactory position in Bulgaria with its increasing production of opium and its manufacture of enormous quantities

of heroin in disregard of treaty obligations. Inasmuch as it was the exceptional imports of acetic acid anhydride into Bulgaria which led to the discovery of the clandestine production of heroin, of which acetic acid is a constituent, the advisory committee is recommending all Governments to furnish statistics of their imports and exports of acetic anhydride, together with their origin and destination. The lamentable situation in China was deplored by the representative of that country; not only is she the victim of illicit imports of morphine, heroin, and cocaine sent from other countries, but is herself a large producer of opium and has within her borders clandestine manufactories of the narcotic alkaloids. Manchuria and Jehol, now outside the jurisdiction of China, are, despite a Government monopoly system, increasing the poppy cultivation and in clandestine factories are manufacturing morphine and heroin, which are smuggled to the United States and other countries.

From a recent answer given in the House of Commons it appears that the area under cultivation of the opium poppy in British India has now been reduced to 37,012 acres. The export of India opium, chiefly to States in the Far East, continues; some 2000 chests, of 140 lb. each, were exported in the year 1932, about half of which was dispatched to the Straits Settlements. The price realised is 4000 rupees per chest.

FOREIGN BODIES IN THE ABDOMEN FOLLOWING OPERATION

AN extraordinary case of tolerance to the presence in the abdomen of a foreign body left behind in the abdomen is noted this week in our medico-legal columns. The frequency of this accident is the subject of an interesting article in a recent number of the *Policlinico*,[1] where Dr. G. Rizzo describes the case of a woman, aged 25, who had a laparotomy performed for pelvic trouble following an abortion. The wound had practically closed, but an abdominal fistula remained from which exuded pus and some blood also during menstruation. Pain, however, continued, and four months later she was admitted to hospital where examination showed a fistula above the pubes and a large mass to the right of the uterus about the size of a fœtal head. Laparotomy disclosed that the mesentery, cæcum, sigmoid, and a portion of the small intestine formed a large mass with the uterus and adnexa on the left side. After separation of the parts involved, a gauze tampon 7 × 5 cm. was found in the midst of the mass. Recovery was uneventful and the patient left the hospital 33 days after the operation.

The interesting fact in the story is that, as would be expected, radiological examination failed to show the presence of any foreign body, a failure that would not have happened in the case noted on page 381. The question is raised whether by any means a gauze tampon could be rendered visible to X ray examination. Reduer states that the frequency of the occurrence of a foreign body being left in the abdomen after operation is about one in a thousand cases. It is to render the diagnosis of foreign bodies which are invisible to X rays possible, and to relieve the surgeon from grave responsibility, that many surgeons have suggested the use of some material which would be visible to X rays during operations. Halban suggested placing a nickelised iron round each tampon, while Döderlein uses a bronze wire. Reduer himself proposed the placing into tampons and compresses some means of contrast which would have the same absorbent qualities and the same sterilising properties as gauze, such as a thread 2–3 cm. long, impregnated with some substance opaque to X rays, such as silicate of zinc, tannate of lead, or wolframate of zinc. He has shown by radiograms how satisfactory is this method, thanks to which large or small tampons become visible to X rays when left in the abdomen or other region of the body.

Dr. Rizzo asserts that every person subjected to abdominal operation should be exposed to radiological control. By this means the avoidance, sometimes catastrophic, of apparent cures after forgotten tampons may be eliminated or their consequences minimised, to say nothing of relieving the operator from accusations of neglect and protecting him from being mulcted in damages on the part of the patient.

[1] Policlinico. Practical section, 1934, xli., 1056.

FACTORY HEALTH AND HAZARD

SOME knowledge of bygone reports would be needed for a full appreciation of the descriptions of modern industry given by the Chief Inspector of Factories in his annual report[1] which has just been issued. Factories are increasing in size rather than in number; single-storied buildings for the most part, they are well-constructed with adequate air space, good heating and ventilation, excellent lighting, and up-to-date sanitary arrangements. Electric drive is replacing steam in rolling mills and in the textile trade; electric welding is transforming shipbuilding and constructional engineering. At one large iron works more than 700 houses are to be erected for the employees; and we read that factory life raises the standard of personal hygiene among girls, and that the net result of industrial life upon women is good and getting better. Risk has arisen in the past as new organic compounds have been introduced, particularly as solvents; but now Imperial Chemical Industries Ltd. have arranged for each compound to be physiologically tested before it is brought into use. But all is not reformed. Bat's-wing gas burners, and even candles, still illuminate tenement factories in Sheffield, while the toll of avoidable accidents is unduly large, and will, as was pointed out in our columns last week (p. 338), remain so until more attention is paid to safety devices. It is certain that active safety committees can exert a beneficial influence upon both frequency and severity rates; one interesting scheme was the issue every week of packets of cigarettes to the group of workers that had no lost-time accident, each packet being contained in a wrapper bearing an appropriate safety-first slogan. This led to a particularly high standard of safety being reached.

Various occupations have no recognised hazard, but Dr. J. C. Bridge is inclined to regard this as due to lack of data which cannot be gathered until more whole-time doctors are attached to works; on the whole however he holds that industrial employment does not affect the worker adversely. Cases of lead poisoning remain few; but of two workers manufacturing lead arsenate, one exhibited definite symptoms of lead without any signs of being affected by arsenic, while the other developed arsenical poisoning without any symptoms of lead. Epitheliomatous ulceration from contact with coal-tar products claims many victims; there were 40 deaths. Periodical examination of those exposed to risk provides safety by affording prompt treatment; there was

[1] H.M. Stationery Office. Cmd. 4657. 2s.

no fatal ending among 50 cases so examined, as compared with 3 fatal cases among 25 where no examination was offered. Cancer of the bladder is 38 times as frequent in chemical workers as in the male insured population, due apparently to contact with certain coal-tar derivatives. Fourteen cases of cancer of the nose, 13 of them fatal, among those employed at a nickel refinery works remain as yet unexplained. Further investigation of dusty trades has found in sand-blasting a grave risk of silicosis; fortunately, in most instances sand can be replaced by steel shot in the blast, and this almost eliminates the risk. Attention is called in the report to the way in which dust opaque to X rays may simulate fibrotic deposits in radiograms of the chest, and so introduce a difficulty in diagnosis. Diethylene dioxide, used in making artificial silk, gave rise to five deaths from acute hæmorrhagic nephritis with suppression of urine and uræmia; the toxicity of this compound was previously not recognised.

Notwithstanding the prevalence of unemployment, several instances are quoted of excessive hours of work: unbroken spells of 22½ and 37½ hours, 89½ and 78 hours per week. The two-shift system has proved its value in emergency and has in a few industries been adopted as a regular method. Welfare accommodation, particularly at mess rooms, is becoming so general, although not compulsory, that workers complain if it is not provided, thinking its absence to be illegal. The psychological effect of bright workplaces is receiving attention; in one case the walls, fronts of galleries, and doors are painted primrose, handrails light green, steel columns, beams, gantries, and roof trusses aluminium; in another machines are painted light blue to show up against a dark background, and the jibs of fixed cranes and runways are a brilliant red. Indeed, throughout the report there are instances of advance and progress, rather than, as of old, of backsliding and grinding the face of the labourer.

A REGIMEN FOR RHEUMATISM

THE idea of "soil and seed," as applied to disease of the joints, enables us to make a broad distinction between the mainly infective (arthritis) and those in which infection is reduced to a minimum (arthroses). For the latter group, which are sometimes termed degenerative, a failure of nutrient substances to construct or preserve normal bone and cartilage—i.e., a metabolic disorder—is often held responsible. Such a "faulty metabolism" might arise from gastro-intestinal disturbances resulting in interference with absorption of foodstuffs, and Burnett and Ober,[1] of the arthritis clinic of the Peter Bent Brigham Hospital, Boston, describe the regimen by which they try to get this absorption back to normal. Their emphasis is laid on the need for proper habits of mastication of food and for its unhurried passage through the colon in order that complete absorption may be obtained; indeed their desideratum is to obtain the dejecta completely formed and entirely segmented, which in their view signifies satisfactory digestion or "anabolic nutrition." By means of charcoal or millet seeds the intestinal rate was determined, and two-thirds of their patients were shown to have an irritable colon and rapid intestinal rate. The general plan of dieting adopted is to give little food at breakfast or lunch but a substantial amount at dinner; the total caloric value should be sufficient to supply the needs of those who are actively occupied. The diet must be complete and must contain a fair amount of vegetables to make the aliment alkaline. Fruit is taken according to requirement and not till the later meals of the day, so that the consistency of the dejecta after breakfast may be a guide. An essential is the omission of all laxatives, oils, or enemata. Two glasses of water are advised at each meal, one more on rising, and one at bedtime. Exercise is greatly restricted where there is much wasting, and adequate sleep is necessary. If the digestive fluids are deficient dilute hydrochloric acid, gastric enzymes, and enteric-coated pancreatic preparations may be useful. Injections of insulin are sometimes helpful to patients who are abnormally lean. The usual physical methods of treatment—rest, heat, massage, or exercise—are employed to reduce the swelling, alleviate the pain, and restore the action of the joints. Finally, as it takes months and years of anabolic nutrition to overcome the deficiencies in these cases, constant encouragement towards greater activity is very necessary. Of several hundred patients at the clinic, many could not be taught or would not coöperate; but of those who followed the instructions for at least five months more than a quarter are said to have been cured, with relief of pain and swelling and normal motility of the joints, while about half have improved.

[1] Burnett, F. L., and Ober, F. R.: Amer. Jour. Med. Sci., July, 1934, p. 93.

GASTRO-JEJUNAL ULCERATION

EXAMINATION of the records of patients on whom gastric operations were performed 20 or 30 years ago is making it easier to understand the cause of gastro-jejunal ulceration. Mr. A. J. Walton, who has lately written in these columns [1] on the prognosis of peptic ulcers treated by operation, has also described [2] in detail his experience of this particular complication. In 1859 gastric operations which he personally performed, there were, he says, 31 cases in which gastro-jejunal ulcer subsequently developed—an incidence of only 1·6 per cent. They are divided into those in which operation was done between the years 1913 and 1922 inclusive, and those operated on in the ten years since. In the first ten-year period 765 cases show an incidence of 2·3 per cent. (18 developed gastro-jejunal ulceration) and this lends support to the assertion that the number of cases increases with the time over which the patients are followed. Such figures, however, cannot be interpreted aright without consideration of other factors, such as the experience of the operator and the nature of the operation. Walton does not find any evidence in his cases for an increased incidence with anterior gastro-jejunostomies, and his general conclusion is that gastro-jejunal ulceration is almost entirely a complication of gastro-enterostomy for ulcers in the region of the pylorus and the duodenum. In only 2 of his 31 cases did it follow partial gastrectomy, and he believes that the more extensive the gastrectomy the less chance there is of anastomotic ulcer. The nature of the original lesion is of paramount importance: thus anastomotic ulcer never follows an operation for carcinoma—a fact which in part at least explains its low incidence after gastrectomy. Of the ætiological factors hyperchlorhydria is generally considered to be the most important, and it is noteworthy that the average acidity of the gastric juice has been found to be higher with duodenal than with lesser curve ulcers, and to be relatively higher, again, in those cases of duodenal ulcer which later developed gastro-jejunal ulceration. Walton agrees with other observers that infection elsewhere is liable to increase the incidence of ulceration. He also finds some reason to believe that

[1] THE LANCET, July 7th, p. 37.
[2] Brit. Jour. Surg., July, 1934, p. 33.

incomplete apposition of the gastric mucosa, such as may occur at the point at which the continuous mucosal suture is begun and ended, may determine the site of an ulcer—more especially when there has been excision of the redundant mucosa along the suture line. Unabsorbent sutures have not the importance in the production of these ulcers which was once attributed to them.

Two clinical types are described by Walton. One shows hæmorrhage as the main symptom, and he states his opinion that hæmorrhage after gastro-enterostomy for duodenal ulcer always comes from a marginal ulcer and never from the original ulcer. The other shows symptoms of indigestion, more or less mimicking the original lesion, but with vomiting conspicuous and pain often referred to the left side and to the lower abdomen rather than the epigastrium. Taking all the cases together pain is much the most prominent symptom. For treatment Walton strongly advocates partial gastrectomy and quotes Finsterer as stating that if three-quarters of the stomach is removed recurrence never takes place. His own figures show 1 recurrence in 61 cases.

TREATMENT IN THE OXYGEN CHAMBER

A CHEMICAL study of the changes brought about in normal persons, and in patients suffering from cardiac and pulmonary disease, on breathing an atmosphere containing 45 per cent. of oxygen for periods of a week or more has been made by D. W. Richards and A. L. Barach.[1] The chief changes found in two normal subjects after a week in the oxygen chamber were a considerable fall in pulse-rate and a small increase in arterial oxygen saturation and in the level of the CO_2-dissociation curve. The patients investigated fell into three main groups—arterio-sclerotic heart disease, rheumatic heart disease, and pulmonary fibrosis with cardio-respiratory insufficiency. A majority had congestive heart failure with œdema, and all had failed to improve on usual measures such as rest, digitalis, diuretics, and oxygen by nasal catheter. On transference to the 45 per cent. oxygen chamber there was usually some relief of dyspnœa and restlessness within a few hours, and in some the relief was progressive, becoming complete in several days. This was accompanied by a raising of arterial oxygen saturation to normal levels, increase in the blood CO_2, diuresis, and increase in the urinary chloride, and a fall in pulse-rate and in venous pressure. The arterio-sclerotic and pulmonary groups gave a much better response than the rheumatic group. It is interesting to note that dilution of the blood appeared to occur as the signs of congestive failure cleared up; and Richards and Barach correlate this with the decrease of vital capacity of the lungs sometimes observed at this time, suggesting a further widening of the pulmonary blood depôt. When the changes brought about by treatment in the oxygen chamber are compared with those which accompany the relief of congestive failure without oxygen treatment, the main differences are found to be a greater quantitative increase in arterial oxygen saturation, increase in blood CO_2, and decrease in blood chloride in the oxygen-treated cases. This form of treatment seems to be useful in any case of cardio-pulmonary disease in which dyspnœa resists other measures, and anginal pain, too, is said to be relieved by it; presumably this refers especially to angina occurring at rest and apart from recent coronary occlusion. From the chemical point of view Richards and Barach state that, while a low arterial oxygen saturation is a certain indication, oxygen-want may be present when this is within normal limits. Cyanosis also is not a safe criterion of oxygen-want; thus the treatment may be beneficial when cyanosis is slight and of little use when it is conspicuous.

[1] Quart. Jour. Med., July, 1934, p. 437.

AIDS TO CHOLECYSTOGRAPHY

THE introduction of tetraiodophenolphthalein marked a great step forward in the diagnosis of gall-bladder diseases, but this method has the disadvantage that the drug is somewhat troublesome to administer and takes several hours to enter the gall-bladder. Attempts have been made to speed up the process, and S. Zanetti, of Bologna,[1] has used for this purpose a subcutaneous injection of 1 mg. of adrenaline an hour after the patient has taken 80–100 g. of sugar. In healthy persons, Zanetti says, the shadow appears two hours and sometimes less after the injection and lasts for several hours more. Its depth varies with the standard of hepatic and biliary function, and delay in appearance is, it is stated, of diagnostic importance, showing a failure to reduce glycogen or to concentrate bile rapidly which ordinary cholecystography would not reveal. Somewhat similar investigations have been made by D. Barbieri and F. F. Tosatti,[2] who have studied the rapidity with which the tetraiodide shadow is obtained in normal persons following the intravenous injection of a number of substances, including adrenaline, pituitrin, urotropine, histamine, acetylcholine, and hypertonic and isotonic solutions of sodium chloride. Of all these substances acetylcholine served to give the earliest shadow, the gall-bladder being visible within half an hour, and consistently and clearly seen within an hour, of the injection of the tetraiodide. The dose was 3 cg. of acetylcholine injected intravenously a quarter of an hour before the tetraiodide. Urotropine, they also found, caused some acceleration in the appearance of the shadow, satisfactory cholecystograms being obtained in 1 hour 45 minutes from the time of injection. With adrenaline, however, the gall-bladder only became visible after about 4 hours and 40 minutes, and Barbieri and Tosatti conclude that whereas acetylcholine, urotropine, and pituitrin all accelerate the procedure of cholecystography, adrenaline and histamine could not be shown to do so. Their results were obtained on 20 normal patients, and have not as yet been applied to cases of hepatic disease. The difference between these findings and those of Zanetti are not perhaps as surprising as appears at first sight, for the number of cases examined is relatively small, and much variation has been noted in normal persons when tetraiodide is employed alone.

[1] Presse méd., May 23rd, 1934, p. 849.
[2] Policlinico, June 25th, 1934, p. 963.

THE BACKWARD AFRICAN NATIVE

IN December last the Secretary for the Colonies asked the governor of Kenya whether he was in favour of the proposal put forward by Dr. H. L. Gordon for a collaborative research into the nature and causes of native backwardness in East Africa. A memorandum written by the director of medical services and approved by the director of education and the chief native commissioner has now been signed by the governor and sent to the Colonial Office. It is strongly in favour of the proposal. In a recent address to the Kenya Society for the Study of Race Improvement, Dr. Gordon pointed out that East African backwardness was formerly attributed

entirely to nurture and not at all to nature; if this were true, research into the social heritage of the native would be sufficient. He believes, however, that it is only by inquiry into the biological heritage of the African that he can be given an appropriate place "within an East African State shared in by European, Asian, and himself." Observations made by Dr. Gordon and Dr. F. W. Vint which bear on the development of the brain of the African native were recently described in our columns (1934, i., 357).

PROGNOSIS

A Series of Signed Articles contributed by invitation

XV.—PROGNOSIS IN CRETINISM

CRETINISM is one of the diseases which were first, and for a long time, recognised in early life before adults were known to be also affected. It was described by Paracelsus in the fifteenth century, whereas it was only in 1871 that Hilton Fagge prophesied that adult cretinism might occur, and in 1873 that his senior colleague at Guy's Hospital, Sir William Gull, described a "cretinoid condition supervening in adult life in women," to which W. M. Ord, in 1877, gave the name myxœdema. The delay in the recognition of the adult form of thyroid deficiency and its correlation with cretinism may reasonably be explained (1) by the much more striking manifestations of cretinism, due to arrest of development and growth both in body and brain, the latter often amounting to mental deficiency; and (2) by the difference between (*a*) the large number of cretins in parts of Europe where goitre was endemic, and (*b*) the sporadic and relatively infrequent occurrence of adult myxœdema. The effect of thyroid insufficiency in the fœtus and infant before complete development and growth have taken place must obviously be more far-reaching than it is when the hormonic secretion fails in an adult. There are all grades from the endemic cretin idiot, through sporadic cretinism, myxœdema of infantile, childhood and of adult life, to benign or non-myxœdematous hypothyroidism. Though endemic cretinism was known in the fifteenth century the sporadic form (T. B. Curling, in 1850, recorded two cases probably of this nature) was not definitely described until 1871 by Hilton Fagge, when endemic cretinism had died out in this country. When, as in endemic cretinism, the thyroid insufficiency begins in fœtal life the damage is greater; secondary changes occur in the central nervous system and elsewhere. Changes in the parathyroids are suggested by the occurrence of cases of "nervous cretinism" with cerebral diplegia not only in endemic cretinism but occasionally also in the sporadic form. There appear to be transitions between the endemic and sporadic forms of cretinism, and some of the worst cases seen in this country may be of essentially the same nature as those seen in districts where goitre is markedly endemic. It may be difficult to decide whether a given case should be regarded as one of sporadic cretinism or of infantile or childhood myxœdema due to some post-natal thyroiditis. There is not any tendency for the disease to be self-limited and to undergo spontaneous cure; untreated cretins may live long, but remain dwarfs and mental defectives. The prognosis as regards improvement depends on life-long thyroid treatment.

From what has been said it follows that the earlier in life thyroid deficiency begins the less likely is well-marked benefit to result from thyroid treatment. Further, the earlier this treatment is started the better, generally speaking, are the prospects of success. There are, it must be admitted, exceptions to this rule; in endemic cretinism and in sporadic cases with spasticity the response to treatment, especially as regards mental improvement, is usually unsatisfactory; in this "nervous cretinism" the administration of parathyroid in addition to thyroid extract has been recommended (McCarrison). Otherwise the benefit due to thyroid treatment is striking, even dramatic, and rapid.

Treatment by thyroid preparations should begin as early as possible after the condition is diagnosed and be continued for life. Administration should be oral, and the proper dose must be determined for each patient, for this may vary considerably in different individuals. As some cretins are hypersensitive to thyroid, the first dose should be small—a total of ¼ to ½ grain in the 24 hours, preferably given in two instalments of thyroideum siccum B.P., or its equivalent of some other preparation. The cretin should then be carefully watched for symptoms of intolerance—namely, vomiting, diarrhœa, faintness, and fever. This intolerance has been overcome by a series of small doses (J. Thomson). If no toxic symptoms follow, the dose should be repeated on the third day so as to allow for the latent period before thyroid extract exerts its effect. The dose should then be increased every week until satisfactory results are obtained without toxic symptoms, such as malaise, headache, nervousness, sweating, and progressive loss of weight, which show that the amount is excessive. In patients otherwise doing well thyroid treatment often causes troublesome enuresis. For a baby a daily dose of two grains commonly acts well, and for older patients double that dose or more may be necessary to get the best results, which are obtained by amounts just short of those causing signs of intolerance. The most exact means of determining the dose is estimation of the basal metabolic rate, but as this is difficult in babies and young children careful clinical observation must be relied on.

If the treatment is interrupted the symptoms return after a few weeks, even when great progress towards the normal has been made; the treatment is substitutional and not curative.

As already mentioned the results of treatment vary, but usually after a few weeks physical improvement is quite obvious, especially in the facial appearance. Sometimes the coarse hairs drop out at an early stage to be succeeded by a better crop. Growth is particularly rapid at first. When treatment is begun in late childhood softening of the bones may follow, and necessitate rest. Eventually the one-time cretin may become physically indistinguishable from ordinary people, and be able to earn a living. Mentally, however, improvement is usually less perfect, and children are more or less backward for their age. There are exceptions; a cretin treated by Cockayne gained a scholarship. Females may conceive and have normal offspring.

Prophylaxis.—When a goitrous mother has had a cretin child it would be advisable to treat her with thyroid during subsequent pregnancies.

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SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION

MEETING IN BOURNEMOUTH

SECTION OF NEUROLOGY, PSYCHOLOGICAL MEDICINE, AND MENTAL DISEASES

A MEETING of this section, with Dr. EDWARD MAPOTHER (London), vice-president, in the chair, was devoted to a consideration of the

Differential Diagnosis of Functional and Organic Nervous Disorders

Dr. GEORGE RIDDOCH said he proposed to use the word "functional" in this connexion as equivalent to psychogenic. In some disorders the signs present may indicate an organic change in the nervous system though the abnormal physical alterations underlying it cannot be demonstrated by the pathologist. The main burden in the differentiation of these conditions falls therefore on the clinician. The value of a careful history covering the whole of the patient's life is to be emphasised. The psychoneurotic will almost always have shown from childhood onwards an incapacity to strike a bargain with existence; this failure of adaptation should always be a requisite for diagnosis. Unless this search for a psychogenesis be made such symptoms as sleeplessness, fatigability, and headache may not be recognised in some cases as signs of an organic affection. Even where there are no physical signs, such a symptom as transient diplopia should make the physician suspicious of organic disease, as in disseminated sclerosis; in this condition emotional changes are not infrequent, and may be wrongly regarded as confirmatory of a functional disorder. Passing from symptoms to physical signs, one had to exclude the exaggerated reactions to fear which might, however, be due to hyperthyroidism. The physical signs in neurosis would be those of hysteria. Here diagnosis must rest on (1) the absence of signs of organic disease, and (2) the presence of positive signs of hysteria. There are a number of findings, such as papillœdema and optic atrophy or a true extensor plantar reflex, which are invariably of organic origin; among these are dysphasia, true nystagmus, absence of vestibular reactions, local muscular atrophy with electrical alterations following paralysis, and abolition of the tendon jerks. Certain sensory changes were likewise organic—e.g., homonymous or bitemporal visual field defects, especially if quadrantic, pain referred to the distribution of the spinal posterior roots, lightning pains of tabes, dissociations such as may be found in syringomyelia. Always, however, the observer must be certain of the adequacy of his methods of diagnosis, and he must be familiar with the normal variations. Where the plantar toe reflex is doubtful, the response in the quadriceps and hamstrings should be observed also. The differences between movements of voluntary withdrawal and what occurs commonly in severe spastic paralysis of organic origin should be easily recognised, once they have been observed.

The physical signs of hysteria, Dr. Riddoch said, are usually accompanied by a freedom from worry, which is indicative of the satisfaction the patient gets from this solution of his mental conflict. Since these symptoms depend on the patient's idea of what constitutes a paralysis or fit or disorder of sensation they do not conform to the rules of pathological physiology and anatomy. Hysterical paralysis is often selective. Voluntary movement appears to be impossible in the affected part, though there may be no wasting or reflex signs of organic significance. The muscles in question may be used in one voluntary movement and not in another. There is also display of excessive effort, shown by general violent exertion and also by strong contraction of the opposing muscles. Resistance to passive movement may be encountered; it must be distinguished from muscular rigidity due to pyramidal and extrapyramidal motor lesions. Contractures and disorders of gait should not present difficulty. The sensory changes are anomalous in that they do not conform to anatomical distributions. Sharpness of delimitation and response to suggestion are important points. The inevitable indirect consequences of organic sensory loss may be absent in hysteria—e.g., pupillary reaction to light brisk though blindness is complained of. In fits a number of points of distinction are available. In this connexion the possibility of confusing a hysterical amnesia with automatism following petit mal attacks must be considered. Chronic epileptics are often emotional; this characteristic is frequent in organic affections. Diagnosis finally must be recognised to be a matter not only of symptoms and signs but of the whole behaviour of the individual in the past as well as in the present. A neurotic, moreover, might develop organic troubles, and anxiety consequent upon physical disabilities might result in mental instability.

Dr. A. A. W. PETRIE said that the standpoint was shifting towards a search for physical causes. It was probable that in the future disorders now called psychogenic would be recognised as physiogenic. Consideration of the patient's whole make-up and circumstances often saved time in diagnosis: hypochondria illustrated the value of this inquiry. Neurasthenia was closely akin to the state of affairs seen after a debilitating illness. Any chronic associated factors such as anæmia, tuberculosis, or other chronic toxæmia had to be eliminated. It might be an early stage in a depressive psychosis. Myasthenia gravis might be mistaken for neurasthenia in rare instances. Encephalitis lethargica, however, was more likely to be mistaken for dementia præcox. Neurosyphilis had to be considered, especially when a neurasthenic attack occurred for the first time in middle age. In anxiety states there was often a mixture of sympathetic and parasympathetic symptoms. Where consciousness was lost epilepsy or some cardiac affection like coronary thrombosis might be suspected. Interparoxysmal symptoms were of value in clearing up the diagnosis. Hysterical reactions could be more quickly and accurately diagnosed if the situation of the patient received attention. Hysterical symptoms represented an idea of the patient tending to satisfy the subconscious purpose. The lesion would be usually a loss of function but associated with the petulant emotional reaction of the hysteric. The symptoms might be either on the psychological or the physical plane.

Convulsions might be difficult to diagnose if they occurred in an epileptic with hysterical manifestations; the combination with petit mal was often deceptive until unexplained enuresis or some other indication of the epilepsy was encountered. It must be remembered that slow-growing tumours might

cause convulsions as long as 17 years before death. Localisation by mental symptoms was not trustworthy in these cases. In tumours of the frontal lobe the early appearance of mental symptoms led to errors in diagnosis. In attempting to distinguish between disseminated sclerosis and hysteria, the frequent coexistence of hysterical symptoms and those due to the organic lesion had to be considered; generally, also, the paraplegia, if it occurred, was more suddenly and dramatically complete in the hysteric. Hysterical paralysis might be followed by disuse phenomena. Even lack of control of the organic sphincters might at times occur. Usually, however, the general conduct was excellent apart from the disorder complained of. The psychological basis of a hysterical paralysis could often be traced. The behaviour of the patient during physical examination was of much help.

Fits at times, and in their early stages, represented definite symbolic movements on the lines of a compulsion neurosis. Sexual incompatibility might manifest itself as hyperæsthesia or other disturbances associated with dyspareunia; these could readily be interpreted when their basis was recognised. They might even be elaborated into hypochondriacal ideas with abnormal paranoid trends. Mutism and stupor were not always easy to diagnose; somnolent cases of encephalitis lethargica, narcolepsy, and cerebral tumour might resemble functional stupor. Many cases of cataplexy proved to be hysterical. Neglect of the psychological aspect in any case might lead to the placing of undue emphasis on individual symptoms, with consequent failures in diagnosis.

The CHAIRMAN said that Dr. Riddoch had seemed to incline towards the psychological point of view in his emphasis on the positive criterion of psychogenesis in functional disorders. The carrying of this principle to excess was in practice the main cause of failure to recognise organic conditions. Moreover, the discovery of an adequate psychogenesis might be a very lengthy process such as one would scarcely be able to undertake unless one were already sure the condition was a functional one. In psychoneurotic patients it was easy to be misled by an ætiological red-herring. In considering all the history it had to be borne in mind that the mental symptoms of incipient and insidious organic disease were related to the type of personality and to details of personal experience; they might be quite indistinguishable from those of functional conditions. Where the organic affection was acute or rapidly advancing one found reductive symptoms, but if it developed insidiously, symptoms of decontrol, of emotional imbalance might be the main ones; the patient then became more than ever himself. Moreover, he distorted experience in various ways identical with those which we called mental mechanisms. If one based one's diagnosis on the discovery of apparent psychogenesis in the history, one might thus be led into error. There were few people who had not had experiences which would suffice to account for a neurosis if one took the customary view of psychogenesis.

Dr. GREIG ANDERSON (Aberdeen) pointed out the difficulties that arose if one used such a broad definition of the term "functional" as that proposed by Dr. Riddoch; he instanced epilepsy and narcolepsy. The distinction between neurosis and psychosis was a valid and fundamental one. The ambiguous term "borderland case" should be abandoned because it suggested a transition from neurosis to psychosis. Organic nervous disorder was from the first irreversible, it showed a definite stability, and followed a definite course. One saw this if one contrasted the patient who had disseminated sclerosis with a psychoneurotic. A patient's statement of his symptoms should not be accepted at face value; it should be inquired into and analysed. The chronological sequence of the symptoms was of great importance—e.g., in cerebello-pontine lesions. He agreed with Dr. Petrie as to the great care that should be taken before diagnosing a psychoneurosis in a middle-aged person who had previously not shown any such condition.

Dr. HELEN BOYLE (Hove) thought that the meaning of the term "functional" required clarification. In a larger sense there was no distinction between functional and organic. There might be abnormal physical change due to functional disorder; instances of this were mucous colitis, indigestion, and hyperthyroidism following anxiety states. Psychogenic fits might be quite indistinguishable from organic ones. The person as a whole must be considered and the patient seen alone if errors of diagnosis were to be avoided. Even in organic disorders a good bedside manner might be therapeutic. Physiological dysfunction following a psychogenic disorder should be dealt with as well as the underlying cause. Careful investigation of the whole life must precede diagnosis, and here one was obliged to consider religion, mysticism, and philosophy. C. G. Jung had presented this general conception in an illuminating way.

Dr. FERGUS FERGUSON (Manchester) recalled that the term "functional" was sometimes used to imply that the patient had nothing the matter with him, could control his symptoms if he chose, and did not require treatment. Patients found such a diagnosis most provoking. In a series of cases he had found that errors of diagnosis were most often made in the presence of dementia paralytica, diffuse frontal tumour, Parkinson's disease, cerebral arterio-sclerosis, myasthenia gravis, cerebral injury, and neuritis. It was wrong to suppose that general paralysis could not be present unless there were grandiose and expansive ideas. The history in disseminated sclerosis was often more helpful than were the physical signs. In cerebral arterio-sclerosis it must be remembered that the symptoms were not only focal. The patient's age, the condition of his arteries, and his psychological abnormalities were to be regarded; the blood pressure was not always high. Peripheral neuritis affecting the upper limbs or the lower limbs elsewhere than in the sciatic nerve often was overlooked in diagnosis. The distribution of the pain, the presence of tender spots and, possibly, reflex changes were to be considered; often it occurred in people who also had an anxiety state.

Dr. R. D. GILLESPIE (London) said the discussion had shown how opinions varied according to one's point of view. Dr. Petrie had emphasised the swing towards the organic side, but there had also been a change of attitude in the opposite direction. He disagreed with Dr. Petrie as to the possibility of curing anxiety states by remedying faulty methods of contraception. The distinction between functional and organic must be insisted on. It was necessary to elucidate the psychological history, however tedious and lengthy this might be. All physical symptoms and signs should be presumed to be of psychological origin unless some definite organic disorder be present. Some misleading effects of emotional disturbance may be observed in specially predisposed persons. Signs conform to the patient's conception of the disease in a psychoneurosis, but they must be relevant to the complaint. The time

relation is of importance in determining psychological causes but there may be a long delay; because of this latent period of rumination, more than a temporal relation must be sought in psychogenesis. The negative characteristics of a psychoneurosis were its unlikeness in symptoms and in natural course to any known disease. There might also be a multiplicity of symptoms in various systems. Statistical probability as to the nature of a particular symptom was also important—e.g., vertigo. Mental examination should be part of routine examination. There was a midway group of cases which illustrated how psychological factors might be as potent as physiological ones; they were additive though not necessarily mutually replaceable. Asthma illustrated this, as did eczema and prurigo. The differentiation should be, not into psychogenic and physiogenic, but into how much is psychogenic and how much physiogenic.

Dr. DOUGLAS GRANGER (Bournemouth) remarked on the frequency with which problems of this sort occurred in everyday general practice. The advanced chronic neurasthenic might tax one's skill in diagnosis; one had to exclude any associated chronic physical factor. Anæmia might prove very intractable in this regard, but it was important to recognise it; treatment of the anæmia had in his experience even averted the need for certification in one patient. Myasthenia gravis might at first be seen with only fatigability, though later indubitable. The basal ganglia were more often affected than was perhaps recognised; lesions here might be responsible for transient symptoms such as tremor. The apparent apathy of Parkinsonism was deceptive; these patients were often by no means apathetic.

Dr. L. A. WEATHERLY (Bournemouth), president of the section, recalled the advice given him when he was a young man—viz., to regard every case of hysteria as due to an abnormal love of sympathy, and to get such patients to discover some pain or other on to which they might displace their trouble.

Dr. AUBREY LEWIS (London) pointed out that in the course of an organic illness a clinical picture might be found that satisfied every positive requirement for a diagnosis of functional disorder. Instances of this might be found in compulsive phenomena after encephalitis lethargica, depressive states in early G.P.I., hysteria after carbon monoxide poisoning, agitated depression in cerebral arterio-sclerosis. Apparent occupational neurosis might be observed in an extrapyramidal disorder; concentric narrowing of the visual field in gunshot wounds of the brain. A satisfactory psychogenesis may often be found even in these organic cases. It was not sufficient to view such phenomena from an exclusively psychological or exclusively physiological standpoint. The common explanation was that there was a constitutional predisposition released by the physical noxa, or reacting towards the manifestations of this. But there were some cases in which evidence for such an explanation could not be demonstrated satisfactorily. The problem raised by these cases was of considerable importance for practice as well as for theory. It not only required some working notion of the nature of the interplay between environment and morbid potentiality which resulted in mental illness, but upon the answer to it in a particular case must depend the prognosis and in some measure the mode of treatment adopted. Illustrative cases from a series collected at the Maudsley Hospital indicated the danger of the assumption that there were any positive criteria of a psychoneurosis which could be taken to exclude an organic basis.

Dr. T. A. WILLIAMS (Bordighera) considered the terms used insufficiently precise. A psychoneurosis should never be diagnosed by exclusion; there must be positive psychogenetic signs. These may be discovered in an ordinary consultation; it did not require a lot of time. Not all cases were either physiogenic or psychogenic. Status lymphaticus and other disorders might be the cause of dubious diagnosis; the metabolism of the patient should be investigated and chemical changes looked for. Fatigue might be a sign of dissatisfaction in patients with failing activity. In America people were highly but not accurately educated in psychogenesis, more so than in England; cults such as Christian Science and Free Thought had prepared the way.

Dr. MURDO MACKENZIE (London) suggested that the dissensions between the psychiatrist and the neurologist were of very ancient date. Functional disorders had to be differentiated by neurological criteria which did not interest the psychiatrist as such. The conversion symptoms in hysteria could be removed by crude suggestion. Anxiety and neurasthenia were terms which could well be dispensed with by psychiatrists.

Dr. H. SIMMONS (Bournemouth) quoted a case which illustrated the value of "sympathetic neglect" in such patients.

Dr. JAMES COLLIER (London) remarked on the insight the old Greek physicians had shown into the nature of these conditions; at Epidauros the methods used were worthy of note. The cleverness of some functional manifestations should be emphasised. Fits might be wrongly diagnosed by the most expert neurologist.

Dr. RIDDOCH, in closing the discussion, agreed that the terms "functional" and "organic" were misnomers but held that they had practical value. It was in the early stages of arterio-sclerotic dementia or G.P.I. that one met anxiety and other functional syndromes. Even a single interview often provided one with much material in the way of total history which helped one in dealing with the disorder. Neither the neurologist nor the psychiatrist could remain exclusively in his own field.

Dr. PETRIE referred to the large issues raised in this discussion. He did not consider, as some speakers had, that neurosis and psychosis could be regarded as sharply defined and separate conditions.

SECTION OF RADIOLOGY AND ELECTROTHERAPEUTICS

THE president, Dr. J. H. DOUGLAS WEBSTER (London), being in the chair, Dr. W. J. TURRELL (Oxford) opened a discussion on electrotherapy in the treatment of

Diseases of the Genito-urinary System

The main forms of electrical current employed were, he said, the constant or galvanic current, interrupted currents of low frequency, and interrupted currents of high frequency. The constant current owed its main effects to the reflex action induced by the stimulation of the cutaneous nerve-endings by the electro-deposition of various ions. In its local or polar application it was one of the most valuable remedies available. A zinc rod introduced within the uterus and connected with the positive pole of a source of supply carried a series of zinc kations with the positive charge down to the mucous membrane, where the hydrogen of the tissues and blood continued the conduction. The mucous

membrane thus formed a virtual pole at which the zinc ion formed an oxychloride of zinc by interacting with the tissues; this chemical decomposition and the subsequent caustic action of the new compound thoroughly and intimately destroyed the mucous membrane. If the indifferent electrode surrounded the whole circumference of the abdomen the destruction was complete and evenly distributed. When uterine contractions causing pain were excited the treatment was stopped—usually in about 15 or 20 minutes. Pain in the early stages indicated complications in the appendages, in which case the treatment was unsuitable. Zinc electro-deposition was undoubtedly better than curettage, as it required no nursing-home, anæsthetic, or confinement to bed. A similar method could be used for treating gonorrhœa.

Interrupted currents of low frequency were of relatively little use in genito-urinary conditions. The Smart-Bristow coil indirectly helped in malposition of the uterus by restoring tone to the abdominal muscles, and the faradic coil was useful for the treatment of incontinence of urine. The Morton wave current thoroughly pervaded the muscle or organ treated, and excited more powerful contractions with less discomfort than any other method. It was invaluable in prostate cases. Interrupted currents of high frequency were very valuable in diseases of the genito-urinary system. There was probably no specific wave-length at which any particular micro-organism could be destroyed, but an optimum wave-length at which it could be destroyed at a minimum voltage. Diathermy was extremely valuable for spasmodic dysmenorrhœa, and the short-wave high-frequency currents would probably prove to be of special value in these cases. The short waves exerted their effects solely by a condenser field action. No current actually passed through the skin and, as a result, the tissues of the body reacted evenly and uniformly.

ENLARGED PROSTATE

Dr. F. HOWARD HUMPHRIS (London) said that physiotherapy provided measures by which some prostate patients might be saved the risks of a major operation and reprieved from the miserable sentence of wearing a suprapubic tube or the unhappiness of leading a catheter life. In applying the static wave current a metal electrode was passed into the rectum and laid alongside the prostate. Its other end was connected with one side of the static machine and a current was passed through which was interrupted from 120 to 150 times a minute. At each interruption any muscle in contact with the metal contracted and relaxed. The method had no electrical or heating action but was purely mechanical. Patients had reported even after the first treatment that the sense of weight in the perineum was less, and that at the end of ten daily applications the discomfort and necessity for getting up at night had disappeared. The condition of the bladder was improved by the stimulation and consequent restoration of tone to the muscle-fibres which were continued on to it. The gland was soon reduced in size and lost its tenderness. The treatment did not render subsequent operation more difficult. Contra-indications were long-standing cases, residual urine amounting to more than 3 ounces, cystitis, or renal complications giving rise to back pressure in the kidneys. On the other hand, X rays would relieve the symptoms even if the size of the prostate remained the same. Diathermy was the method of choice in infective prostatitis. The rationale of the treatment depended upon the power of the diathermy current to destroy the organisms in situ, and the temperature should reach 105° or 106° F. It was passed between an electrode in the rectum and a pad on the abdomen, or a metal ring round the waist. Physiotherapy would not entirely supersede operation, but besides the operative mortality it would also obviate a high post-operative morbidity.

Dr. D. D. MALPAS (Bournemouth) remarked that surgeons often discouraged pre-operative therapy; he quoted the remark of one, "I wish you fellows would leave these prostates alone. My fingers hurt for days afterwards!"

Dr. AGNES SAVILL (London) spoke on the treatment of discharge in female patients. She said that in pruritus or eczema of the vulva she had for many years treated the skin alone, without permanent success, and had found it necessary to treat the discharge also. This might be due to inflammation of the lining membrane either of the cervical canal or of the uterus. It could be cured by ionisation, but if the discharge was from the uterus the treatment should be applied as far as the fundus. The treatment of discharge from the cervix was sometimes exceedingly difficult, because the inflammation was so severe that an electrode could not be passed right up. This was a reason why physical treatment had become discredited. When there was much inflammation and œdema affecting the whole or nearly all the genital tract, ionisation was not sufficient, but diathermy was invaluable. It was also necessary to treat the general condition, which was like an allergic one—the exudative diathesis.

Dr. G. B. BATTEN (London) reported that Dr. Justina Wilson had been using diathermy with a 4·5 metres wave-length with good results for all staphylococcal infections.

Dr. HOWARD HUMPHRIS said that a wave-length of 3·6 metres was more powerful; the shorter the more lethal.

The CHAIRMAN remarked that diathermy of this frequency was used to kill animal tumours, and suggested that the coincidence might be significant.

CANCER OF THE BLADDER

Dr. A. J. DURDEN SMITH spoke of radium treatment in this condition. None of the methods of treatment was, he said, satisfactory, because surgery still failed in a large number of cases and most bladder cancers were beyond the reach of surgery when first seen. The local glands were involved late and, indeed, might not be involved even in quite inoperable cases. Early metastases were rare. Excision in many cases was not difficult. On the other hand, the patients were usually past middle life and in a poor condition, and excision generally involved transplantation of the ureter. Radium, however, could be used when the growth was close to the opening of the ureter. The best way of using radium itself was to insert needles into the base of the tumour, but radon seeds were far more satisfactory and were being more and more used. They could be left permanently in position, were easier to manipulate than needles, and were more adaptable. They could be inserted by the suprapubic route or through the cystoscope. The latter procedure required great patience, and bleeding was often an obstacle. Radiographs should be taken in 48 hours and again in four days to make sure that all the seeds remained in position. The patient need not remain in bed more than four or five days or in hospital more than a week. The suprapubic route had the advantage that a growth in any part of the

bladder could be treated and inspected at operation, and that the introduction of the seeds was more accurate. The operative mortality was between 10 and 15 per cent., and 31 per cent. of the patients remained alive for three years or more after surgical operation. Some 60 per cent. of cases could not be cured by surgery at all. Of these 60 per cent. and 43 per cent. of papillary cancers and 20 per cent. of the infiltrating cases might be alive three years after radium treatment. The mortality was low and complications were rare. There might be a very slowly separating slough. Papillary carcinoma was sensitive to radium and amenable to treatment when not too extensive. The infiltrating type was more radio-resistant, and operable cases should be treated by the surgeon. An extensive inoperable case might be made more miserable than before by widespread interstitial irradiation. Cystoscopic implantation of seeds should be limited to papillary cases where the growth was not more than 2 to 3 cm. in diameter. Larger growths should be dealt with suprapubically.

Dr. R. G. HUTCHISON described a method of treating carcinoma of the penis by means of radium needles applied round a collar of rubber sponge which was fitted over the organ. The results, though slightly better than most of those hitherto recorded, were not very encouraging. Most of the cases of epithelioma of the bladder treated at Manchester were in advanced stages. The growth was exposed by a suprapubic incision and radium was implanted through the wound. Three out of nine patients were alive and well after two and before three years. The technique had been shortened by the use of gold seeds, which were implanted beneath the growth and wide of it in every direction. The seeds must be distributed accurately, and the suprapubic method was necessary.

Dr. ROY WARD (London), speaking on carcinoma of the penis and prostate, said that cases must be chosen with care, eliminating those with a marked degree of surrounding infiltration and much invasion of the substance of the organ. On the other hand, a hypertrophic carcinoma, however large, responded well. If no glands were palpable it was unnecessary to irradiate the inguinal regions; when glands were palpable these areas were irradiated with moulded plaques. Of 26 cases, 13 had had palpable glands and 13 had not, but the first group had seemed to do better, 3 being alive at the end of 4½ years with no sign of disease. Of the other group, only one was alive at the end of the fifth year. For carcinoma of the prostate interstitial irradiation was the most satisfactory method. Approach was made either through the bladder or through the perineum. Radium could relieve the symptoms for varying periods of time.

Dr. DURDEN SMITH asked why in some of Dr. Hutchison's cases the penis had been amputated. Dr. HUTCHISON replied that in the early days of the treatment the dosage of radium had sometimes been incorrect. Amputation was now much rarer.

Dr. BERNARD WARD (Birmingham) said his own experience of X rays had been most unfavourable. The treatment had often caused a severe reaction as the bladder tissue was very radiosensitive. He preferred to cut as free a way through as he could. The transurethral method gave the patient the maximum of comfort for the remainder of his life. He said, in answer to the Chairman, that he had applied radium seeds and needles through the perineum and by the suprapubic method. He had excised as much as possible of the prostate and had planted the radium in what was left of it. He had also applied radium in a mould fitting the remainder of the prostate cavity. All these methods had proved disappointing.

Dr. DURDEN SMITH, in reply, said that implantation by means of the cystoscope was tedious and uncertain and advocated the suprapubic approach. The cystoscope should be kept for very small growths and for palliative measures.

X RAYS

Dr. G. HARRISON ORTON, after discussing units of dosage, said that no attempt should ever be made to give a single massive dose to the kidney, and that the effect of divided doses must be carefully watched. X rays might be recommended in advanced inoperable cases for, although they did not cure, they might bring about a marked reduction in size of the growth. In the bladder also operation was the treatment of choice, and X ray treatment had proved disappointing in cases where operation or diathermy had failed. Immediate post-operative radiation might increase urinary infection. On the other hand, simple enlargement of the prostate was often favourably influenced by X rays, but the results were neither certain nor constant. Quite a large dose was necessary. When the prostate was malignant X ray treatment compared favourably with surgery, as the operation was severe and not very successful. Sometimes the growth disappeared completely under radiation, but sometimes there was only temporary improvement. Great care must be taken to reduce urinary infection to a minimum, and unless this could be done X ray treatment was contra-indicated. All patients should be kept in a nursing-home and carefully watched during the treatment.

Some growths of the testicle were quite radiosensitive, but they should be removed surgically and X rays then given to the glands. Tuberculous epididymitis responded very favourably to quite small doses of X rays. Cancer of the cervix was undoubtedly favourably influenced, but a recurrence was the rule rather than the exception. Combined X ray and radium treatment offered a better prospect than either given alone, but he would not apply radiation to any operable case. He thought that radium should be applied six weeks to two months after X rays, not before them. Cancer of the body of the uterus was rather less favourably influenced; X rays were superior to radium. Some types of ovarian growth were radiosensitive, but the best use of X rays was post-operative. X ray treatment was most successful for certain non-malignant conditions, such as menorrhagias of the menopause, menorrhagias at other periods with no definite pathological condition of the uterus, menorrhagias associated with fibroids, and cases where, owing to dysmenorrhœa or other conditions, sterilisation was considered advisable. The dose might be reduced to some 25 per cent. and spread over three months, when the patient had practically no disturbance. Every case must be thoroughly examined by the gynæcologist before treatment.

Small doses of X rays were stimulating, and might be used for sterility, amenorrhœa, and other ordinary disturbances of menstruation. Treatment could do no harm and was successful in about a quarter of the cases. Finally, pruritus vulvæ responded often very favourably to small doses, although some patients would not respond at all.

Dr. S. L. MUCKLOW (Cheltenham) said that prostatic enlargement gave a favourable response to X rays in selected cases. He described his technique,

which embodied Schall's locating device of placing a lead ball beside the prostate and screening. X rays were best suited to the soft elastic gland. In 25 cases he had had 20 successes.

Dr. BATTEN suggested that the contra-indication of two or three ounces of residual urine practically meant all cases of prostatic enlargement.

The CHAIRMAN doubted whether epidermicidal doses caused permanent damage to the skin. Coutard, he said, had not seen a case in ten years' practice. It was possible that the criticism had been applied to the treatment of malignant disease of the bladder, in which X rays had not been satisfactory through causing fibrosis. Coutard's method did not now produce this disadvantage. He pointed out that cure was not only a matter of local action, and mentioned experiments in progress at the Middlesex Hospital on injections to increase radiosensitivity. He said that the value of X rays in this condition should be far better known. Many old gentlemen would be much relieved and there would be far less post-operative misery. He warned physicians to follow up cases treated by X rays lest the original condition should prove to have been malignant.

SECTION OF ORTHOPÆDICS

AT a meeting of this section, with Mr. HARRY PLATT (Manchester) in the chair, a discussion on

Adolescent and Senile Kyphosis

was opened by Mr. C. LAMBRINUDI (London). He described five clinical types of adolescent kyphosis. In the first the onset is insidious in a patient who has otherwise no symptoms. In the second the condition appears slowly in a debilitated child (often above the average height) and may be accompanied by fatigue and pain. A third type appears suddenly in a child who may have had an injury or been suddenly subjected to heavy muscular effort—the type described by Scheuermann as "apprentice kyphosis." Pain is a definite feature, often with a rise of temperature, tenderness of the spinous processes, and spasm of the back muscles. A fourth type is seen in tall, lanky children, with some measure of endocrine disturbance. Albanesi has collected a series of such cases with changes in the sella turcica and the limbs. A fifth type of case presents an acute onset after a severe pneumonia. The features common to all types are the constancy of involvement of the lower dorsal region, the absence of angular kyphosis, typical X ray appearances, and, in all types except the last, a tendency to actual shortness in the hamstring muscles.

The radiographic appearance varies with the stage of the disease. In the earlier stages the intervertebral discs are narrow. The adjoining margins of the bony vertebræ are irregular, the anterior margin may be blurred. The ossification in the epiphyseal plates may be irregular, with an erosion of the body producing the web-like appearance. At a later stage the upper and lower surfaces of the vertebræ in proximity to the narrow disc may be sclerosed. The epiphyseal plate may be fragmented. The typical punched-out appearance, attributed by Schmorl to a hernia of the nucleus pulposus, may now be seen.

The speaker dealt with the prevailing views of the ætiology of adolescent kyphosis and devoted much attention to Schmorl's theory of changes in the intervertebral discs. He regarded oft-repeated minor injuries, stresses, and strains as possessing greater significance than the circulatory, infective, or endocrine factors which had been adduced. The condition of the hamstrings was also an important factor: the examination of 400 school-children showed a definite correlation between adolescent kyphosis and short hamstring muscles. He described a spring mechanism whereby the elongation of the hamstrings permits of flexion of the spine as in touching the toes with the outstretched hands. Children with short hamstrings are peculiarly prone to injure the spine if compelled to undertake violent and jerky toe-touching exercises. Such movements are conducive to injury and rupture of the intervertebral disc and subsequent hernia of the nucleus pulposus with destruction of the neighbouring portion of the vertebral body.

Dr. JACQUES CALVÉ (Berck-Plage) discussed the movements of the spine in general and laid emphasis on the clinical fact that the pain of adolescent kyphosis is not situated at the kyphos but in the region of the compensatory curves immediately above and below. For this reason therapeutic treatment should consist of strenuous efforts to correct the compensatory curves by mechanical means. Untreated cases of lower dorsal kyphosis develop an exaggerated lordosis above and below the hump. The lordosis must be reduced so as to prevent shortening of the spinal length. Dr. Calvé illustrated the method of application of the Minerva plaster jacket, with special attention to the disposition of pads to correct the lordosis. He showed that a patient in such a jacket could undertake exercises of the upper and lower limbs in the reclining position with a view to increasing slowly but surely the effective length of the spine. The jacket, provided with a window over the hump and pressure pads above and below, obviated the need for continuous recumbency. By means of diagrams the speaker indicated the relation between the position of the nucleus pulposus and the amount of flexion and extension in the dorsal and lumbar vertebræ. He emphasised the extent to which pain could be minimised by correction of the cervical and lumbar lordosis.

Prof. H. A. HARRIS (London) illustrated the emergence of the pattern of growth in the spine from the earliest embryonic stages to adolescence. The general scheme of growth and differentiation was described in terms of the craniocaudal gradient. The pattern of growth in the human spine is disproportionate in that there is from birth onwards a relative shortening of the cervical column and a considerable lengthening of the lumbar part of the spine throughout the whole period of growth. The dorsal part of the spine in proximity to heart, lungs, and sympathetic chain maintains a constant proportion of the total length of the presacral vertebræ. The spine varies within narrow limits at all ages, occupying 37 to 40 per cent. of the total body length, and the dorsal part of the spine maintains an equally steady relationship of about 37 per cent. of the total spinal length. Both the primary centres of ossification for the bodies of the vertebræ and the epiphyseal plates of cartilage, which acquire secondary centres of ossification near puberty, appear first in the lower dorsal region. The bony epiphyseal plates limit the growth in length of the vertebræ in precisely the same manner as the epiphyseal plates of the long bones limit growth in length. The prolonged childhood of man, the postponement of puberty, and the late age at which growth in the lower limbs is terminated are accompanied by a postponement of the time of consolidation of the bony vertebræ by union of the epiphyses. Radiograms of various domestic animals, such as the guinea-pig, pig, and goat, showed that the secondary epiphyseal centres

of ossification are present even at birth in accord with the early onset of puberty and consolidation of the spine in these forms. A comparable process is seen in the union of the three parts of the innominate bone in all animals at puberty. The proportion of the total length of the spine occupied by bony vertebræ or fibrocartilage illustrates the disproportionate growth in the various parts of the spine. From birth to adolescence the total thickness of the fibrocartilaginous discs in the cervical and dorsal region is doubled, whereas in the lumbar region it is increased fourfold.

Certain types of congenital abnormality of the spine were illustrated, and emphasis was laid on perversions of growth, nutritional disease, and infection as a cause of kyphosis. Illustrated cases were shown which could not be interpreted in terms of Schmorl's theories of injury to the fibrocartilaginous disc. Senile kyphosis Prof. Harris described as a reversion of the spine to its original blastemal stage, the cycle presenting many points in common with those seen in the lower jaw and the vault of the skull. In childhood the fibrocartilages are relatively free from the infective processes, whereas the bone and epiphyseal cartilage are prone to various infections. After middle age the bony vertebræ are peculiarly susceptible to senile changes, particularly nutritional diseases of the type of osteoporosis and osteomalacia. The cartilaginous discs and ligaments of the spine are peculiarly susceptible to inflammation, calcification, and ossification as a result of chronic infections, such as pyorrhœa, leucorrhœa, and gonorrhœa.

Mr. Ross SMITH (Bournemouth) considered in detail the differential diagnosis of adolescent kyphosis and spinal caries. He described cases in which infection was an undoubted factor. He refused to accept Schmorl's theory as the sole explanation of the condition and maintained that congenital weakness of the cartilaginous plates above and below the nucleus pulposus could hardly explain a kyphosis which was always delayed until puberty. The relation of senile kyphosis to arterio-sclerosis was mentioned and toxic and nutritional factors were regarded as necessary concomitants to senescence and trauma.

Mr. W. MACKENZIE (Newcastle-on-Tyne) presented a brief historical survey of the gradual classification of different types of kyphosis during the last twenty years. He showed a series of radiograms of typical cases which corresponded to the analysis of kyphosis into its existing types.

Mr. WHITCHURCH HOWELL (London) discussed the rôle of infection in the adolescent and senile type of kyphosis. In senile cases chronic sepsis was by no means uncommon. He made a plea for the early recognition and treatment, by an orthopædic team, of cases in children, particularly since the condition was closely interwoven with the problem of disability attributed to accidents in industry. It was not enough to examine the overgrown, the underfed, or the chronically septic. The general examination at the school clinic should be directed towards the early recognition and orthopædic treatment of postural defects.

Miss M. FORRESTER-BROWN (Bath) strongly supported Mr. Lambrinudi's views on the importance of short hamstring muscles as a predisposing factor to spinal injuries. She had traced numerous cases of sacro-iliac strain to the vigorous attempts of certain pupils to stretch their shortened hamstrings. Toe-touching exercises were a danger to the spine unless the necessary degree of suppleness was acquired gradually. Many cases of adolescent kyphosis which could not always be conveniently treated in the recumbent position responded well if placed in a light Goldthwait brace and subjected to a gradual course of abdominal exercises calculated to develop good compensatory curves.

SECTIONS OF OBSTETRICS AND PUBLIC HEALTH

UNDER the chairmanship of Prof. J. M. MUNRO KERR (Glasgow) the sections of obstetrics and gynæcology and the section of public health combined to consider the question: are we satisfied with the

Results of Antenatal Care

Dr. J. S. FAIRBAIRN (London) said the object of the meeting was to review antenatal work, to see where its weaknesses lay, and to re-state its aims and the attitude of mind in which it should be approached, as well as the principles underlying its practice. The antenatal clinic, he said, deserved much of the credit for the impulse leading up to a general recognition of "midwifery as a branch of preventive medicine"—a slogan that had a wide vogue for a time, although all it implied was not understood and certainly not acted upon. In midwifery our first and chief duty was to learn what can be done by constructive physiology, that is, the adoption of measures tending to promote normal function throughout the processes of reproduction. After that came the "preventive" part, strictly speaking, being the removal or correction of possible causes of interference with physiological action. Lastly, came the watch for early evidence of disordered function and the effort to restore the normal before more serious or permanent trouble arises; for example, the testing of urine to discover albuminuria and the conditions underlying it.

Dr. Fairbairn referred to the importance of psychological reactions in pregnancy affecting the mother's health, a problem which had scarcely entered the philosophy of antenatal care, although it was now generally agreed that the largest factor in the failure to complete expulsion was the emotional effect of anxiety and fear and the early fatigue which followed in their train. Supervision of the pregnant woman must be thorough and continued; it called for varied forms of service from various types of worker and for close contact between them all. It was so integrated with the rest of midwifery practice that it could not be separated without both suffering. Its segregation in the public antenatal clinics has been open to criticism on this score, though the policy was forced on local authorities by the Act of 1918. In spite of team-work and a certain degree of uniformity in practice, our large maternity hospitals were not free from lack of coöperation: there was one member of the staff for the prenatal, another for the intranatal, possibly a third for the postnatal care of the mother, and certainly another for the mother and infant in the infant welfare clinic. The ideal supervisor of the mother and her infant throughout reproduction was the family practitioner; but, if he is to fulfil his part adequately, he must have assistance from a midwife working under his direction to undertake the observational, educational, and mothercraft services given by health visitors, social workers, and other officers in hospitals and public clinics.

Dr. G. F. BUCHAN (Willesden) analysed the objectives of antenatal care and considered where the present methods failed. He felt sufficient

emphasis was not laid on the basic need for adequate nutrition; that there was not sufficient effort made to follow up women who failed to keep their appointments for antenatal examination; that hospital beds were not available in sufficient numbers for antenatal care. Present methods had not effected any material change in the healthiness of the offspring. The obstetrician would have to extend the scope of his work to include the child under four weeks and to correlate antenatal work and confinement with the condition of the child at birth. He spoke of the importance of adequate records; since at present the best methods of supervision were not in general use and no standard method had been laid down or applied, it was impossible to assess the value of antenatal care from the gross results. He thought a new kind of specialist was required; one whose functions would be first antenatal care in its wide sense, having regard to both the mother and the unborn child; secondly, the confinement; and thirdly, the care of the mother and child for a period after the birth. A wider specialism on these lines would secure better results than specialisms limited to the narrower fields of obstetrics on the one hand and pædiatrics on the other.

Prof. F. J. BROWNE (London) said that although the mortality of infants under one year had fallen, the neonatal mortality showed no corresponding decrease. The death-rate from eclampsia had changed but little during the last 12 years, although there was a distinct reduction in the last two years. And yet eclampsia was almost entirely preventable. One reason why antenatal care failed to influence statistics of morbidity was the increase in recent years of primary as compared with subsequent births. Much of the present antenatal care was, however, inadequate and ineffective. It was so easy to become slipshod when abnormalities were comparatively rare. It was difficult at present to assess the quality of antenatal work done by midwives. Was it too much to hope, he asked, that all the midwives of the future might be trained in the estimation of blood pressure? There was, he thought, much to be said for the whole-time clinic officer. They were usually keen and nowadays they must have had post-graduate experience in maternity work. They were less likely than general practitioners to be hurried. They could devise a follow-up system to ensure regular attendances, and as they saw so many patients they should become more skilled in diagnosis than the practitioner. Unfortunately their work suffered, both in interest and usefulness, from the fact that they were not allowed to give treatment. Effective antenatal care meant institutionalisation; the time was coming when none but normal midwifery (and perhaps low forceps cases) would be undertaken in the home.

Dr. ETHEL CASSIE (Birmingham) said it was useless to feel disappointed with a remedy which had never been properly applied. Whether at antenatal clinics or elsewhere antenatal care did not reach the standard laid down by Circular 145/M.C.W. (1929) and this was put forward not as an ideal but as a practicable minimum. In Birmingham in the year 1916 561 women attended 250 sessions; in 1932 8174 women attended 1892 sessions—representing no less than 50 per cent. of the women whose homes are reached by health visitors. But the standard of this antenatal work was for the most part not high enough, although as good as any in the country. This was shown in the records of stillbirths, maternal mortality in childbirth, and from puerperal sepsis. If antenatal care had not lowered maternal mortality it was because it had not yet had a fair chance of doing so. At a city maternity home where antenatal care was carried out at a high standard and where the medical officers were able to insist on patients carrying out directions, the maternal mortality-rate was low, the stillbirth-rate remained the same as that of the city as a whole, while the neonatal mortality improved. It was, she thought, essential that the obstetrician making himself responsible for antenatal care should be as much a physician as a surgeon; the tendency to combine obstetrics with gynæcology had led to some neglect of the expectant mother. Among the factors which delayed progress was the inadequate training of the medical student and midwife in obstetrics and infant care.

Discussion on these papers was opened by Dr. E. H. T. NASH (M.O.H. Hounslow) who spoke of the difficulty experienced by administrators in deciding on the relative value of schemes.—Mr. ALECK BOURNE (London) considered too much had been expected of antenatal care; good obstetrics was all-important.—Dr. GAUTIER SMITH (Bournemouth) emphasised the psychological aspect of obstetrics.—Dr. W. H. F. OXLEY (London) insisted on antenatal work being done by general practitioners and deplored the failure of antenatal clinics to reduce maternal mortality.—Mr. L. C. RIVETT (London) felt that the bulk of the work should be done by the midwife.—Dr. JANE TURNBULL (Ministry of Health) gave some figures illustrating the insufficient antenatal care given where the mother had died in childbirth. Such care should cover home supervision, home helps, and the provision of nutrition in necessitous cases.

The CHAIRMAN remarked on the differing aspect of the problem in cities and rural areas. He was of opinion that midwives should be responsible for normal midwifery in consultation with doctors. The best arrangement was for municipal midwives to work through the antenatal clinics. General practitioners should join in the scheme, possibly combining other specialties with antenatal care. The rural problem would require an extension of present methods with the practitioner playing the chief part.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

RACIAL AND PROFESSIONAL SALVATION

THE minister of public health recently warned us that any nation whose birth-rate falls to 18 per 1000 of the population is likely to become extinct, and pointed out that the Hungarian birth-rate does not stand far above this danger line. Though equal, probably, to that in other countries where the standard of living is similar, it is lower than that of the Balkans or eastern nations. In 1932 the number of live births per 1000 of the population was 23·4, and in 1933 21·5, while the corresponding death-rates were 17·9 and 14·6. Compared with 1929 the number of live births shows a decrease of 3·6 per 1000, but as there is also a decrease of 3·2 in the death-rate the real decrease in the population would only be 0·4. In Germany there was a decrease of 0·5, and except in Italy there has been a similar decrease in every other European country. Economic conditions are undoubtedly an important cause, but that there are other factors is shown by the fact that the birth-rate had fallen even in the richest classes of society. The problem is one which, like

the *egyke* or one-child system which prevails among the peasants, can be overcome only by moral suasion.

As for the medical profession, the number of practitioners in Hungary is 9000 for a population of something more than 9,000,000, and in the present economic distress the country is unable, in the minister's view, to maintain so many. In rural districts, he said, there was 1 doctor to 900 inhabitants; in Budapest the rate was 1 per 300. Three hundred patients could not support a doctor and the minister believed it was necessary for the State to help the medical profession—not by limiting the number of new doctors to be trained, but by increasing the scope of medical work. Medical men should no longer be asked to do preventive work gratuitously, but new positions should be created for them; and they should be appointed to many positions now held by laymen; for example, in most villages at present there were lay coroners.

AN UNUSUAL PUNISHMENT

Last winter Dr. X, a military surgeon, attempted to induce abortion in a girl of 19, and she died of hæmorrhage due to the operation. Post mortem it was found that she was not pregnant at all, and that death was due entirely to clumsy malpraxis. A court martial in Debrecen sentenced him to 15 months' imprisonment, forbade him to practise medicine for two years, and ruled that he must undergo a thorough course in pathological anatomy and pass an examination in that subject before taking up his work again.

A MEDICAL DIRECTOR OF OPERA

The *Praxis Medici*, a Rumanian monthly medical journal, reports that Dr. Victor Papilian, professor of anatomy at the University of Cluj, the capital of Transylvania, has been appointed managing director of the Cluj opera. Prof. Papilian has not resigned his chair and for the present at least will fill both positions.

BRUSSELS

(FROM A CORRESPONDENT)

A BILL TO REGULATE THE SALE OF ALCOHOL

A CABINET crisis which has interrupted the parliamentary session in Belgium has delayed a discussion of the Bill on "Alcoholic Beverages," which bade fare to be interesting. The position is as follows: Under the existing legislation, beer or wine may be sold or drunk on the premises in all licensed establishments; but the sale of distilled beverages is forbidden in smaller quantities than 2 litres, and the drinking of it on the premises is never authorised. It is thus impossible, at the restaurant, to take a "fine" (liqueur) after dinner, though it is easy, on returning home, to take as much of it as one wishes. A Bill, due to parliamentary initiative, has been presented, which will grant to public establishments the retail sale of alcoholic beverages. This Bill has met with enthusiastic supporters and equally stubborn opposers. The medical profession as a whole are hostile to it, fearing its consequences upon the public health, but certain members of the profession and certain political groups are partial to it. The chances for the Bill are almost even, the attitude of the Government being as yet undecided.

THE LATE KING ALBERT

The Committee of the *Journées Médicales de Bruxelles*, under the leadership of its former presidents, have laid a wreath on the tomb of King Albert I., its protector and friend, in the crypt of Laeken, which had been especially opened for this ceremony by royal permission. This manifestation of loyalty to the dynasty had been organised for the very day fixed for the opening of the fourteenth session of the Congress of the Journées Médicales; the function, however, was cancelled because of the national mourning. When it took place it acquired a considerable importance owing to the presence of delegations from the Academy, the Medical Faculties, the Army Sanitation Corps, the Medical Federation, the principal medical institutions and organisations, the learned societies, and the medical press. The ceremony was short but moving. After the wreath had been placed on the royal tomb a minute of silence was observed, and for a short instant the thoughts of all dwelt on the memory of a great king.

BATHING AT OSTEND

The civic authorities of Ostend have granted the right of the sea-bathing on the sands to a private individual, who will thus be able to impose a tax on bathers and price upon cabin locations. Now the remarkable installation was seen in Ostend last year of the "Palais des Thermes," an ultra-modern, hydrotherapeutic establishment, laid out with much thought for comfort and elegance, comprising a large swimming-pool and a miniature sea-bath, while equipped also for the treatment of certain medical affections. The concessionaire declares himself wronged, as the town from which he holds his permit is exploiting the opportunities of its own bathing establishment. This he holds to be disloyal competition, and the case is engaging the law courts.

MEDICINE AND THE LAW

Forceps Left in Patient's Body

AN inquest was held at Southwark on August 2nd upon a woman in whose body a pair of surgical artery forceps, 5 inches long, had been left during an operation for appendicitis thirteen years earlier. Her appendix had been successfully removed in 1921, and there was evidence that thereafter she had been able to do her household duties and to travel without discomfort though she suffered from vague pains from time to time. She had undergone no operation since 1921. On July 16th of this year she was admitted to St. Giles's Hospital, Camberwell, suffering from abdominal symptoms; an X ray examination showed the presence of the forceps. An operation was then performed to remove the forceps, which had ulcerated their way through the intestines. The patient, who was 70 years old, died a few days later. The coroner, Mr. A. Douglas Cowburn, examined several medical witnesses as to the practice of checking instruments in the operating theatre. He was told that forceps were counted in groups of ten before use and were checked afterwards, the theatre sister being responsible. Summing up the evidence to the jury, Mr. Cowburn said that a blunder had been committed 13 years ago and the fact could not be ignored. He considered, however, that the surgeon who conducted the original operation in 1921 ought not to be held blameworthy in the circumstances. It was obvious that the instruments had been miscounted. A surgeon's task, remarked the coroner, was comparable to that of the commander of an army; he could not possibly supervise every detail without so prolonging the operation as to enhance the risk to the patient. The

coroner's jury returned a verdict of death by misadventure, thus negativing any implication of criminal negligence on the part of the surgeon.

A lesser degree of negligence suffices to fix liability for damages in a civil action than is required to justify a sentence of punishment in criminal proceedings. In a civil action, indeed, it might be impossible to dispute that the leaving of forceps in a patient's body is prima-facie negligence. In the legal phrase *res ipsa loquitur*—though the task of removing every swab and forceps is not always so simple as lawyers may think. There would remain, of course, the usual difficulty for the plaintiff to fix the negligence upon a particular person. If the sister miscounts the instruments, is the surgeon liable? On the one side it is argued that the surgeon is responsible for the subordinates who act under his orders and that he must pay for their negligence. On the other side it is argued that a surgical operation is a matter of teamwork, the surgeon being deemed not the army commander but the colleague *primus inter pares*. A similar dispute has occurred where damages are claimed for burns caused by hot-water bottles. The issue is decided on the particular facts of each case and the judges have hardly had the chance to lay down a general rule. The hospital, it is well established, can escape liability by pleading that its only duty was to take reasonable care in appointing its medical staff. In Hillyer *v.* St. Bartholomew's Hospital, where this principle was laid down, Lord Justice Farwell observed that the nurses and carriers assisting at an operation cease for the time being to be the servants of the hospital "inasmuch as they take their orders during that period from the operating surgeon alone." This dictum seems to hint that the nurse's error is the surgeon's liability; but Lord Justice Kennedy made an exception for "purely ministerial or administrative duties," which words might possibly include the routine checking of instruments. Whatever the doubts as to the legal liability, all will be agreed that every possible step must be taken to eliminate the risk disclosed at the recent Southwark inquest. It is interesting to learn that a number of medical students attended the inquest and that the coroner was careful to show them the forceps as an object-lesson.

Diphtheria Patient leaves Hospital

William Simms, suffering from diphtheria, was admitted to the Tolworth Isolation Hospital. Three days later the night nurse found that he had disappeared. The facts were reported to the police who found him at his home in Surbiton. He was fined £1 at Kingston on August 9th for the offence of "exposing himself while suffering from a dangerous infectious disease without taking precautions against spreading it in a public place." The police, it appears, had forcibly to restrain him from embracing his wife. Simms explained to the magistrates that his wife was expecting a child and he was anxious to see her. The chairman reminded him that his conduct might have serious consequences to the health and even the life of his own people. Prosecuting counsel said that these proceedings under the Public Health Act were believed to be the first of their kind. Though not unprecedented, such cases are fortunately rare.

PANEL AND CONTRACT PRACTICE

A Survey of the Year

THE fifteenth annual report of the Ministry of Health contains the usual survey of insurance practice for the past year. The scope of compulsory insurance has remained unchanged. A warning is issued against paying contributions for relatives or others who may be working, but who are not employed within the meaning of the Act, in the hope of obtaining benefit in due course. The tendency to do this arises from the threefold benefits of health insurance, contributory pension, and unemployment insurance. Contributions so paid cannot be refunded. There have been two decisions of interest as to employment under the Act. House-to-house salesmen engaged by a firm selling vacuum cleaners and who were paid by commission were found to be employed under a contract of service and therefore insurable. Skippers of trawlers working from an east coast port are not employed by way of manual labour. Voluntary contributors continue to increase: 460,000 (398,000 men, 62,000 women), as compared with 420,000 (362,000 men, 58,000 women) in 1932.

DEPOSIT CONTRIBUTORS

The number remains in the neighbourhood of 230,000, there being a slight increase in the number of entrants and exits in 1933. The number of women is increasing, ten years ago the proportion was about one-third, now it is nearly one-half. There is a special section of deposit contributors to provide for persons unable by reason of ill-health to join an approved society. They receive the ordinary benefits of the Acts and are not limited to the amount standing to the credit of their individual accounts as in the case of ordinary deposit contributors. Their membership on Dec. 31st, 1933, was 6908, an increase of 103 over the previous year. Expenditure on benefits is necessarily heavy, but in spite of increasing membership the amount fell from £20,000 in 1932 to £18,500 in 1933. The reduction in rates paid to women would account for some of this, but the liberal use of the regional medical service has been a contributory cause; 434 cases were referred, and in 60 per cent. of the cases incapacity was confirmed.

REFERENCE TO REGIONAL MEDICAL OFFICERS

There were 503,254 references for advice as to incapacity for work in 1933, of which only 2485 came from doctors; 60 per cent. of them related to women. Those actually examined numbered 268,157 (last year 626,853). The number who required a final certificate before the date of examination was 139,170, and 94,127 did not attend for examination. Of the persons examined 188,693 were reported as incapable and 79,464 (just under 26 per cent.) as not incapable. The number of cases examined by the regional medical staff is less than half that of the previous year. It would appear therefore that the agitation against unnecessary references has borne fruit, and that societies are learning to discriminate which cases should be sent for another opinion. It is not impossible that some insurance doctors have tightened up their certification standards. Sixty-four appeals about incapacity for work were decided by referees appointed by the Minister.

EXTENT OF MEDICAL SERVICE

There were 15,500 doctors in insurance practice, medicine was supplied by about 10,000 chemists' shops, and insured persons entitled to medical benefit numbered 15,150,000. Medical benefit cost £8,420,000, £6,077,000 was paid to insurance doctors, £1,863,080

of the balance to insurance chemists. The remainder was allotted as follows: £203,000 to insurance doctors on account of mileage, £196,000 to doctors for medicine and appliances, £63,900 on account of insured persons taking benefit through approved institutions, nearly £9000 was set aside to enable country doctors to attend post-graduate courses, £7250 was paid on account of own arrangers.

There was an increase of nearly 6 per cent. in the number of insurance prescriptions dispensed as compared with 1932, rising from 56,081,507 to 59,338,504, the number of prescriptions per insured person increasing from 4·19 to 4·56. The average ingredient cost increased from 3·594 to 3·643 pence, and the total cost per insured person of drugs and appliances from 2*s.* 9½*d.* in 1932 to 2*s.* 11½*d.* in 1933. The increase is thought to be due to influenza early in the year. Referees decided during the year that virol was not a drug, that an arch support was an appliance within the meaning of the Act. The following additional appliances were made available as part of medical benefit: brushes and droppers when required for the proper administration of any drug forming part of medical benefit; lubricant for use with urethral catheters.

Of the 990 cases referred as to whether a particular service was within the range of medical benefit, the local medical committee agreed with the insurance committee that 49 were within the scope of the Act and that 941 were outside. Referees decided that four cases of psychotherapy fell outside the scope of the Act, the committees having disagreed on the subject.

Ethics and Contracts at Home and Abroad

"The term 'contract practice' is anathema to the vast majority of individual practitioners in this country," says the *Journal of the American Medical Association* (July 28th, p. 263); "yet . . . conceivably there are situations in which the practice of medicine under a contract may be necessary or desirable." The Association defines contract practice as:

"the carrying out of an agreement between a physician or a group of physicians, as principals or agents, and a corporation, organization or individual, to furnish partial or full medical services to a group or class of individuals for a definite sum or a fixed rate per capita."

It recognises that such practice is not in itself unethical; "the decision as to its ethical or unethical nature must be based on the ultimate effect for good or ill on the people as a whole." Certain features or conditions may be introduced into its working which would be against the public good and therefore unethical from a professional standpoint. Instances of this are solicitation for patients, either by the corporation or by the practitioner; underbidding to secure the contract, which naturally leads to inadequate remuneration and eventually produces a poor medical service; and interference with reasonable competition in a community, which may prevent free choice of doctor—a condition which is one of the foundation principles of general practice.

The judicial council of the American Medical Association have now issued the following statement:

"It is unprofessional for a physician to dispose of his professional attainments or services to any lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit a direct profit from the fees, salary or compensation received to accrue to the lay body or individual employing him. Such a procedure is beneath the dignity of professional practice, is unfair competition with the profession at large, is harmful alike to the profession of medicine and the welfare of the people, and is against sound public policy."

In this country there is still a definite dislike of contract work, whether by medical men or by business firms. In business the remark may often be heard that such and such work was done by contract and so was hurried, or the best materials were not used; and elaborate precautions are almost always necessary to make certain that the terms of the contract are faithfully carried out. Even in this sphere, where possibilities of requirements and their costs are largely known, it does not always follow that the cost by contract will be less than it would have been by piecework performed under honest conditions. The contract is generally made in order to know the limit of financial liabilities, with the hope that at the same time the standard of work will be as good as if payment were being made for the actual work done.

When we come to medical contracts the profession is in a very much worse position than the business contractor. The contracting medical man does not know at all (under National Health Insurance for example) how much work he will be required to do. He does not even know what duties he may have to perform under his agreement, for more duties may be added without any corresponding addition to his remuneration. The same argument applies to other forms of medical contract work. A medical officer of health will have a terrific amount of work to do if an epidemic of small-pox occurs in his area, but his remuneration will not be increased one penny. The house surgeon who receives his £100 a year at some county hospital will not receive any more if he is called up every night in a week for emergency work than if he were able to stay in bed at rest. These unknown liabilities are in the terms of the contract and generally accepted by the profession, but what business men would undertake such liability? The doctor's position is not much better when he is under no employer, but has himself made a contract. The contract patient who demands his services may and often does urgently require them, but such patients are also very apt to make calls, for inadequate reasons, that would not be made if they had to pay for them.

Contract practice would be much more popular in the profession if it could in some way be protected against this sort of thing. Many patients could afford, say, 3*d.* for a bottle of medicine and provision could easily be made for those who could not afford it. If this had to be paid to the chemist by every insured person who required medicine the cost of drugs supplied would be greatly reduced, for only those who really wanted the medicine would then obtain it. So, too, emergency visits and night visits cause a wholly abnormal amount of wear and tear on the doctor's energy (to say nothing of his car), and he needs protection from them by some single-payment system. The present all-in capitation system of payment was chosen in the first instance by the profession because of its simplicity, but, human nature being what it is, it does give rise to apprehension by both doctors and patients that neither are obtaining a fair deal.

METROPOLITAN HOSPITAL SUNDAY FUND.—At a meeting of the council recently it was stated that the year's collections amounted to £61,000, a reduction of £3000 on the preceding twelve months; the broadcast appeal produced only £300 as against £900. The newly constituted ladies' committee will begin work in the autumn.

CORRESPONDENCE

THE "GAS WEDGE" IN THE ÆTIOLOGY OF FISTULA-IN-ANO

To the Editor of THE LANCET

SIR,—Fistula-in-ano has so long been described as "the result of abscess" that this theory of its causation has come to be accepted as fact. But why an abscess in this region should insist on opening both into the lumen of the bowel and on to the skin, and why it so frequently produces such tortuous and branched channels has not been very satisfactorily explained.

The following are references from recent editions of standard surgical works :—

"Fistula-in-ano.—This term is somewhat loosely applied to all conditions in which suppurating tracts are found in the neighbourhood of the anus and the lower end of the rectum. Many of these are merely sinuses which have but one opening. Fistulæ are usually due to rectal or perirectal suppuration, but sometimes result from the ulceration of simple, syphilitic, malignant, stricture of the gut, the inner opening being either above, in the substance of, or below the stricture. This is more likely to be the case when the fistulæ are multiple."—Rose and Carless, "Manual of Surgery," 14th ed., 1933, p. 1229.

"Perianal Fistula.—Fistula formation with perianal abscess as a rule only results if the abscess be allowed to burst. The fistula may end blindly internally, or may communicate with the anal canal below the external sphincter."—Russell Howard, "The Practice of Surgery," 4th ed., 1933, p. 819.

"Fistula-in-ano (anorectal fistula) is a persistent, burrowing, and often tortuous sinus, the result of an unhealed abscess. Nearly one-third of all rectal cases are fistulæ. (Tuttle.)"—Da Costa, "Modern Surgery," 10th ed., 1931, p. 1098.

"The most frequent cause of a fistula about the anus is ischiorectal abscess."—Ashhurst, "Surgery Principles and Practice," 4th ed., 1931, p. 937.

"A fistula is a suppurating tract opening both on to the cutaneous surface and into the lumen of the bowel. A sinus, on the other hand, has only one opening, which may either be on to the cutaneous surface, the cutaneous sinus, or into the lumen of the bowel, the rectal sinus. Both the sinus and the fistula when of rectal origin are always preceded by one or other variety of perirectal abscess."—H. S. Clogg in Choyce's "System of Surgery," 1932.

Having observed some cases in which fistula-in-ano developed without history or appearance of abscess, I was led to question the accepted statement, and I now believe that rectal flatus is the primary ætiological factor in producing these channels. Large quantities of gas collect in the lower bowel and are often held under considerable pressure. This acts in a manner similar to the air in an overcharged tyre with weakened outer cover, in which the inner tube protrudes in the areas lacking adequate support. Likewise in the anorectal section of the bowel the gas under pressure drives a protrusion in the line of least resistance. Each recurrence of this pressure advances the protrusion, so forming a channel into the tissue from the lumen of the bowel, a sinus. Obstacles may be met and so turn the course of the sinus as it progresses in the line of least resistance. Some resisting bands may so cross its path to cause it to branch. Such a sinus is open to invasion of infection and will act as a favourable incubator for the invading organisms, so it is not surprising that abscess is frequently associated with fistula-in-ano. The gas wedge continues to drive the protrusion to an outlet whether abscess has formed or not. The gas pressure is the vis a tergo.

Contributing causes can be found in factors which (1) tend to weaken the textural support to the bowel, and (2) those which favour increase of flatus. Both of these are prone to be more common in patients past 40, since there is a tendency then for more fat to be stored in the connective tissue so weakening the textural support which it offers, and the sedentary life, imposed at this age, fosters constipation and gas accumulation. Any ulceration of the bowel, by weakening it, may readily be the starting-point for the gas wedge to produce a fistula-in-ano.

I am, Sir, yours faithfully,

Harley-street, W., August 13th. R. YOUNG KENNY.

DOES THE PUNISHMENT FIT THE CRIME?

To the Editor of THE LANCET

SIR,—Yet another of those instances of sexual offences by elderly men has been published recently in the daily papers. Such offences are probably more common than is generally known as a certain number of the offenders contrive to sojourn abroad and so escape publicity. Many of such cases occur in men of great intellectual attainment who have spent useful lives in the public service, and their lapses are, in reality, due to periodic disordered impulses combined with failure of mental control. These offences are so repellent to all decent-minded individuals that the punishment inflicted appears to the man in the street to be scarcely adequate; but surely the medical man cannot regard with equanimity the spectacle of a poor old gentleman who has led a useful life being sent to prison because an enlarged prostate and arterial degeneration have led to an offence which with ordinary control he would never have committed. Naturally, one appreciates the difficulty in drawing the line, but this would appear to lie in the determination of loss of control.

Surely it is just as cruel and medieval to send paretic exhibitionists and arterio-degenerate delinquents to prison and disgrace as it once was to put lunatics in irons. An attendant or a mental home appears to be more suitable and would save much private and public distress.

I am, Sir, yours faithfully,

F. A. PHILLIPPS, M.D.

Lower Sloane-street, S.W., August 13th.

BUYING CENTRES

To the Editor of THE LANCET

SIR,—I am assuming that your correspondent, "A Visitor," intended his letter last week, under this heading, to be helpful to the buying centre at the Medical Section at British Industries House, but as more than one correspondent of mine is doubtful as to this, I wish to assure him and your readers that since the official opening of the House the attendance of potential buyers has been very satisfactory. On the day on which his letter was dated I enclosed for your information an exact list of those who visited the Section on July 30th. It will be seen that there were 13 persons, all of them connected with hospitals and five of them from abroad. This list is by no means exceptional. Every day there is a goodly number of serious inquirers and, what is even more to the point, the exhibitors are highly satisfied with the progress of affairs up to date, in a period which, it must be remembered, is the holiday season.

It must not be forgotten that the Medical Section is not a retail affair, but is intended to deal with wholesale buyers and those able to influence buying. There is a visitors' book which each visitor is invited to sign and which he may inspect if he so chooses. Every week a list of visitors with information as to their inquiries is sent to each tenant of the section.

Speaking as chairman of the Medical Advisory Council of the section I may say that my colleagues and I are in no way interested in the financial side of this enterprise (though obviously unless it succeeds on the financial side it cannot succeed on any other side), but we believe that there is a real need for a place at which hospital and institutional requisites can be seen and compared with as little trouble as possible, and that the directors of British Industries House have performed a service to our profession in opening this section. This opinion is fortified not only by the letter of your correspondent, and by the opinions expressed by visitors from all over the world, but also by the recent issue of the report of the committee of the Public Health Congress on Hospital Equipment. This influential committee strongly emphasises the need for standardisation of institutional requirements and the economies which could be effected by expert buying. It is obvious that the Medical Section at British Industries House should further both.

Medical men and all interested in hospitals and other medical institutions are cordially invited to visit the section.

I am, Sir, yours faithfully,

ALFRED COX,
Chairman, Medical Advisory Council.

British Industries House, Marble Arch, W., August 14th.

*** We know that our correspondent wished to be helpful, and we indicated, in a note to his letter, how well the use of the centre should meet many needs of medical institutions and individual doctors. The value of the centre should be widely recognised. The list, referred to as enclosed, is accurately summarised.—ED. L.

PITUITRIN FOR HERPES ZOSTER

To the Editor of THE LANCET

SIR,—I can lend support to Dr. Francis Gillett's account in your last issue (p. 307) of the effect of pituitrin on herpes zoster by reporting a case which I treated just two weeks ago. It was one of great severity involving two dorsal roots; the pain had been uninfluenced by barbiturates, opiates, salicylates, bromides, iodides, chloral, whole-blood injections, and by attempts to anæsthetise the nerves. On the eleventh day I gave an injection of 0·5 c.cm. pituitrin and the patient had his first restful night. Two days later a further injection was necessary, and after another 48 hours, as slight pains had recurred, an injection of Pitocin was given to determine whether the pressor factor was a necessary agent, as the disadvantages of pituitrin are obvious, whereas pitocin can be given with impunity. It is impossible to infer anything from my last injection as the illness was subsiding, but it would be interesting to try the effect of pitocin on an early case. The use of so small a dose of pituitrin per injection probably accounted for the less dramatic relief of pain in my case, probably also for the absence of the undesirable symptoms mentioned by Dr. Gillett.

I am, Sir, yours faithfully,

S. CHARLES LEWSEN.

College-crescent, London, N.W., August 14th.

INDUSTRIAL DERMATITIS

To the Editor of THE LANCET

SIR,—Dr. Arbour Stephens, in his letter in your last issue, raises once more the interesting question of the relation between lowered bodily resistance and the incidence of disease.

That dermatitis should occur in the physically unfit is not a matter for surprise, as the surface horn cells—the natural protectors of the skin—share in the general state, and especially where food is scanty (particularly in fats) or the diet unbalanced, these cells are quick to suffer in function. It has been observed that workers newly returned to work after a period of unemployment seem particularly susceptible to industrial irritants. But this susceptibility from lowered resistance is not of course confined to dermatitis; it is true of other maladies, industrial or not.

While agreeing with the general proposition, I cannot, however, endorse Dr. Stephens' statement that "in many if not most of the industries associated with the production of industrial dermatitis the workers are exposed to small quantities of carbon monoxide," nor have we proof of Dr. Stephens' contention that industrial cancer occurs only amongst workers who have been exposed to the inhalation of CO gas over prolonged periods. On the contrary, the experimental work of Argyll Campbell would suggest the reverse.

I am, Sir, yours faithfully,

SIBYL HORNER.

Home Office, London, August 14th.

CORONARY THROMBOSIS AND AFTER

ANOTHER PERSONAL STORY

To the Editor of THE LANCET

SIR,—I found, for personal reasons (which I intrude), the letter signed "Learn and Live" in THE LANCET last week very interesting and comforting. I am 47 years of age. A year ago I disposed of my practice and took a post as ship surgeon. Of late I had put on a great deal of weight; my friends twitted me, suggesting that after a few months on a ship I should need a crane to get off her. I was a very heavy smoker.

On board I indulged in very strenuous exercise—deck tennis, running round the deck, and swimming. I began to feel muddled in the head and developed slight pain in the chest. Both these things I ignored and continued my exercise. One night, after being asleep for two hours, I woke up with an alarming pain in my chest, which lasted about two hours. I took things very easily for the next four days, but attended to my work. On the fourth day a most severe attack came on and lasted all night. Since then my history is the same as that narrated by "Learn and Live." In fact I was most interested to note the large psychological factor. I can walk miles, but going upstairs, an annoyance, or a competitive game (such as yacht racing), or feeling *compelled* to do anything, bring on pain at once. I have reduced my weight to normal by careful dieting, and taking no liquid at meal times. Nitrites do not ease the pain; I find two hours sleep in the afternoon keeps me free. The notes furnished by "Learn and Live" form quite the best account of coronary thrombosis I have read.

I am, Sir, yours faithfully,

A. B. C.

August 13th.

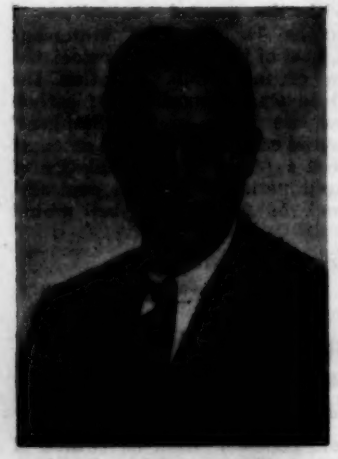
OBITUARY

BERTRAM COLLINGWOOD, O.B.E., M.D. Camb.

PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF LONDON

WE regret to announce the death of Prof. Collingwood which occurred in London on August 9th in the 64th year of his age.

Bertram James Collingwood was born in Sunderland in 1871, went to Caius College, Cambridge, as an undergraduate, in 1889, and took honours in the Natural Science Tripos in 1893. He proceeded then for his medical education to St. Mary's Hospital, and graduated as M.B., Ch.B. in his university in 1900, just previous to the outbreak of the South African war. In South Africa he did good service as a civil surgeon in connexion with the prevalence of typhoid fever which had such a disastrous effect on our forces, and at the conclusion of hostilities his bent towards physiological work was confirmed by his appointment as assistant to Prof. A. D. Waller, who was then working at the Imperial Institute in the physiological laboratory of the University of London, which owed its origin largely to his own efforts and the generosity of his family. The work with which Collingwood was first associated was an investigation into the various dangers of chloroform anæsthesia, Waller's researches following directly upon the report of the Hyderabad Chloroform Commission. These investigations showed the dangers not to depend so much on the total dose administered as on the percentage of vapour in the inhaled air, and Collingwood devised an apparatus for the delivery of chloroform vapour of known dilution with air, which was described in the *Transactions* of the Medico-Chirurgical Society. In association with Waller he communicated to the *Journal of Physiology* papers on the respiratory quotient and carbonic acid estimation, while his individual papers to the same journal included articles upon chloroform apnœa and the absorption of chloroform in anæsthesia, and a description of an apparatus for recording respiration. He published also in the *Transactions* of the Medical Society of London a useful investigation into the ætiology of pulmonary emphysema.



PROF. COLLINGWOOD

[Photograph by Elliott & Fry

In 1904 Collingwood was appointed demonstrator in physiology at St. Mary's Hospital, a post which he filled until 1907, and during this time he proved himself to be a gifted teacher, while he continued his investigations along lines he had already made his own, as well as into other allied problems of the physiology of respiration. So that he had earned high recognition for physiological research when in 1909 he was appointed to the chair of physiology at University College, Dublin. The National University of Ireland had not long been founded, and the difficult task was imposed on all members of the medical staff to get level with the work of organisation essential to the new institution. Collingwood's share in this activity was especially onerous. He proved a stimulating and energetic teacher; his influence in the promotion of research was marked; his classes increased rapidly in size, while his tact and obvious goodwill made him popular with colleagues and students. He developed into a first-class teacher and displayed the qualities as lecturer and demonstrator which later became so conspicuous on his return to London.

Collingwood's services in the late war commenced in 1915 after the first gas attacks upon our troops. He became at once engaged on researches into antigas measures. These were undertaken originally at the R.A.M.C. laboratory, Millbank, but in 1916, with a commission as major in the R.A.M.C., he was appointed chemical adviser to the Irish Command; this position he held till the termination of hostilities, being not only unsparing in his endeavours to make a success of antigas training, but able to make valuable suggestions to the Chief Chemical Adviser of the Home Forces. After the armistice he was retained by the Command, became largely active in the organisation of the scientific side of the Army education scheme and was appointed O.B.E.

For a brief period he now returned to Dublin, but in 1920 he was appointed professor of physiology in the University of London with a chair at St. Mary's Hospital, the position which he was holding at his death. Here it was soon seen that the reputation as thinker, lecturer, and teacher which he had brought with him from Dublin was fully deserved, and he enhanced it by his work at St. Mary's. His teaching aimed always at the application of physiological principles to the treatment of disease, in accordance with the now generally accepted ideal of the medical curriculum, and his wide knowledge of physiology was manifested especially in his expositions of the chemistry of the body. His help and his criticisms were always available to those who worked under him, and, as he was both kind and tactful in rendering assistance to these, he was able to inspire among his fellow workers and his students a zeal for original research. Further, like his famous uncle, Lewis Carroll, he had a humorously whimsical side to him, and this was frequently apparent in his lectures to the considerable appreciation of his audiences. At St. Mary's he was instrumental in establishing the Waller research memorial to commemorate the life work of his old teacher and colleague, who himself had served on the educational staff of St. Mary's for 15 years. At the end of 1932 Collingwood used his influence as a lecturer in the United States in the service of St. Mary's, the object of the lectures being to raise funds for the establishment and endowment of the "Wonder" children's ward in the hospital. This ward is a memorial to Lewis Carroll.

Collingwood's communications to the *Journal of Physiology* of later years include papers in collaboration with H. L. F. Buswell on the tension of carbon dioxide in alveolar air and on chloroform narcosis, and some valuable researches concerning the calcium content of the blood and the influence of variations in its amount on coagulation. In the same journal, in collaboration with M. T. MacMahon, he wrote on anticoagulants of blood and on thrombrin and antithrombrin. To the *British Medical Journal* he communicated in collaboration

with Sir William Willcox a paper on the use of alcohol vapour mixed with oxygen, a subject which he had discussed in the *Transactions* of the Royal Academy of Medicine in Ireland.

Prof. Collingwood married in 1917 Grace Jane Wilkinson, the daughter of Dr. C. Wilkinson, and leaves a widow and three children.

WILLIAM EDWARD COLLINS, C.M.G., M.B. Lond.

HON. CONSULTING SURGEON TO WELLINGTON HOSPITAL

Colonel the Hon. W. E. Collins, whose death was reported from New Zealand on Saturday, August 11th, at the age of 81, was particularly associated with the work of the New Zealand Red Cross Society, and his death will be regretted by all connected with the movement as well as by a large circle of friends.

Born at Monghyr, in India, in 1853, he was the son of the late Dr. J. G. Collins, of the East India Army, and received his early education at Cheltenham, afterwards proceeding to St. George's Hospital for his medical training. He qualified with the diploma of the Royal College of Surgeons in 1876, graduated M.B. Lond. in the following year, and in 1878 sailed for New Zealand, where, at Wellington, his zeal for his profession and his skill as a surgeon soon gained for him an extensive practice. He joined the New Zealand military forces in 1880, and the institution of the Volunteer Bearer Corps of the volunteer movement owed much to his initiative. During the late war he was given command of H.M. hospital ship *Makino* on its first commission in 1915. Later he commanded the *Marana* in 1916 and in 1918. He received the C.M.G. in 1917, and retired the following year. He was chairman of the executive of the British Red Cross Society, to the work of which he was devoted and of which he was made an honorary life member two years ago in recognition of his great service to the cause. A member of the senate of New Zealand University since 1904 he was an examiner in surgery for three years, while he had been on the honorary staff of Wellington Hospital for 30 years and a consulting surgeon for nine years. In 1914 he was chairman of the special committee on syphilis which was set up by the Australian Medical Congress. He had been a member of the Legislative Council of New Zealand since 1907 and was appointed C.M.G. in 1917.

Keenly interested in all forms of athletics, cricket, and tennis, football specially appealed to him, and he played for England against Scotland in the Rugby games of 1874–5–6, and took part in the England *v.* Ireland contest during the last two years mentioned.

Colonel Collins married in 1886 Isabel Georgina, daughter of Dr. David Warren, of Melbourne, by whom he had one son and one daughter.

GEORGE ALEXANDER MOORHEAD, F.R.C.S.I., M.R.C.P.I., D.P.H.

WE regret to record the death of Dr. Moorhead, of Tullamore, which occurred in Dublin on August 3rd in his seventy-ninth year. He had undergone a serious operation a few weeks before his death, and made a brave but unsuccessful struggle for recovery.

George Alexander Moorhead obtained his first medical qualifications at the age of 21 from the Irish Royal Colleges; in 1881 he became a Member of the Royal College of Physicians, and in 1893 a Fellow of the Royal College of Surgeons. He spent his whole professional life in his native town of Tullamore, where he was for many years dispensary medical officer and medical officer to the district hospital. He conducted a large practice for which, indeed, both by his attainments and by his natural capacity, he was well equipped. In 1907 he took the diploma of D.P.H. of the Royal Colleges, and as medical officer of health of Tullamore he was an active sanitarian, the many improvements in draining and housing in the town being due mainly to his initiative and work.

Apart from his profession, much of his leisure was spent in horse-breeding and racing and his stable produced some notable winners. Dr. Moorhead is survived by his wife and a large family of sons and daughters, of whom the eldest son is a member of the medical profession. His death will be felt in a wide circle of patients and friends.

THE LATE DR. ROBERT LAWS

Dr. Robert Laws, whose death we recorded with a summary of his work last week (see p. 318), played such a significant rôle in Central Africa that the following notes on his career, supplied by G. D. S., are welcome.

"Dr. Robert Laws, whose death in a London nursing-home from peritonitis occurred on August 6th, was one of the really great missionaries of modern times. For 52 years he laboured in Central Africa. He first went out in 1875 as medical officer with the original expeditionary party sent by the Free Church of Scotland to carry on the work of Livingstone, who had but recently died. Laws's boyhood's ambition was to follow in Livingstone's footsteps. And the mission which Laws founded and under whose wise and energetic direction it grew and flourished is world-known as the Livingstonia Mission.

"When Laws heard of the plan to establish a mission on the shores of Lake Nyasa he said 'This is the work I have been preparing for all my life.' It was the beginning of a new epoch for Central Africa, when he entered the waters of Nyasa on the little steamship *Ilala*—the first steamship to navigate any of the big lakes. The missionaries found a land all but ruined by constant tribal warfare as well as by the raids of Arab slavers. Their settlements and civilising influence paved the way for the entry of the British Government in 1891 and for a rapid growth of native prosperity, with the return of peace and the spread of Christian education. When Laws retired in 1928 he left behind him a prosperous and peaceful Christian community, numbering 20,000 church members (where 50 years before there had not been a single Christian), with nearly 700 schools, churches, thriving workshops, stores, farms and gardens, dispensaries, and a hospital.

"Laws's versatility, energy, and competence in all departments of pioneer life were almost incredible. He was not indeed a great preacher, but he was a fine schoolmaster and organiser. A skilful translator, he compiled the first dictionary, grammar, and New Testament in the Njanja tongue. He was a good seaman, an expert tracker of game, and incidentally an excellent cook. He thoroughly enjoyed the life of an explorer. He knew how best to establish friendly relations with the wildest of savages, was often peacemaker in their feuds, and many miserable slaves owed to him their release. For civil administration, too, he had talent, and for years many of the natives would recognise no other tax-gatherer than the doctor. His services as physician and surgeon were constantly in request.

"He devised an admirable system of book-keeping, was a good amateur printer, and organised a most efficient postal service. He became, moreover, an

experienced and successful gardener and farmer, and to him Central Africa owes the introduction of many new foodstuffs and of improved breeds of stock and methods of afforestation. Much more than a 'Jack of all trades' he seemed master of all. As a carpenter, builder, and architect he excelled. He acquired and put into practice the elements of road engineering. At the age of 49, when on furlough, he entered as a student in a technical college to make himself proficient in electrical engineering. Later on, during his year at home as Moderator in the Scottish Church, he took a three months' medical course to gain the latest knowledge in this field.

"A graceful tribute to the work of Dr. Laws was paid by the Government of Nyasaland soon after his retirement, when it decided, in recognition of the service he had rendered to civilisation in the Protectorate, to rename Mount Nyamkhowa after him. Now it is Mount Laws, which stands 7000 ft. high, within the Livingstonia Mission estate and looks across Lake Nyasa to the Livingstone Range, which perpetuates the name of that other missionary who was Laws's hero and inspiration.

"Laws was married in 1879 at Blantyre, Nyasaland, to Miss Margaret Gray, who was his able and devoted helpmate until her death in 1931. Their only daughter, Miss Amelie Laws, is a graduate in medicine."

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

THE following appointments have been made: Surg. Lts. H. J. Bennett to *Cyclops* and to *Ramillies*; and S. I. Ballard to *Ramillies* and to *Cyclops*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. H. G. Ungley to *Effingham*.

Surg. Lt. W. H. C. Watson to *Victory* for R.N.B.

Proby. Surg. Sub.-Lt. (D) A. C. Fuller to *Victory* for R.N. Hosp., Haslar.

ARMY MEDICAL SERVICES

Lt.-Col. R. P. Lewis, from R.A.M.C., to be Col.

ROYAL ARMY MEDICAL CORPS

Maj. R. A. Flood to be Lt.-Col.

The undermentioned Lts. (on prob.) are confirmed in their rank: M. S. W. Bisdee, P. O'Shea, R. W. Scott, and J. D. P. Macpherson.

Capt. E. G. Dalziel to be Maj.

Lt. (on prob.) M. W. Allen resigns his commn.

REGULAR ARMY RESERVE OF OFFICERS

The undermentioned, having attained the age limit of liability to recall, cease to belong to the Res. of Off.: Col. W. Bennett (late R.A.M.C.) and Col. L. Wood (late R.A.M.C.).

ARMY DENTAL CORPS

The undermentioned Lts. (on prob.) are confirmed in their rank: K. H. Coulton and J. E. C. Robinson.

TERRITORIAL ARMY

R. J. C. Hamilton (late Offr. Cadet, Univ. of Lond. Contgt., Sen. Div., O.T.C.) to be Lt.

O. R. L. L. Plunkett (late Cadet Lce.-Corpl., Univ. of Lond. Contgt., Sen. Div., O.T.C.) to be Lt.

INDIAN MEDICAL SERVICE

The following appointments are confirmed: Majs. B. R. Tandon, P. V. Karamchandani, and R. K. Misra.

Capts.: K. R. Sahgal, M. S. Gupta, A. N. Chopra, D. N. Chakravarti, S. Annaswami, T. B. Pahlajani, Asa Singh, R. R. Bakshi, B. D. Khurana, D. C. Chopra, Jaswant Singh, Sangham Lal, A. K. Gupta, V. Srinivasan, D. P. Mitra, T. D. Ahmad, M. Jafar, A. M. Chaudhuri, P. V. Bamford, H. D. R. Zecherpel, K. Jilani, J. R. Dogra, S. Narain, F. M. Khan, D. Datt, M. G. Saincher, B. L. Taneja, S. W. H. Askari, Hoe Min Sein, D. P. Nath, and H. H. Mahmood.

The undermentioned appointments are made: To be temp. Lts.: Mohan Lal Gujral, Baij Nath Bhandari, Mohan Singh, Mir Naeem Mahmood, Shaikh Sultan Alam, Beharilal Kapur, Des Raj Sharma, Partap Singh Bassalvi, Mohd. Muzaffar-ud-Din Chughtai, Ghulamahmad Niazmohammad Ahmadi, Prince Mohan Kaul, Amarendra Krishna Dev, Mohammad Akram, D. Satyanarayana Raju, Gurbuxsh Singh, and Balwant Singh Bindra.

The undermentioned officers retire: Lt.-Cols. K. S. Singh and T. F. Owens.

ROYAL AIR FORCE

Flight Lt. B. W. Cross is promoted to the rank of Squadron Leader.

Group Capt. E. C. Clements is placed on the retd. list.

RESERVE OF AIR FORCE OFFICERS

The undermentioned are granted commissions as Flying Officers in class DD: T. G. Hovenden and R. D. Bruce.

COLONIAL SERVICE

Dr. R. Austin has been appointed Medical Officer and District Officer, St. Vincent, and Dr. C. H. Parkin, Radiologist, Jamaica. Dr. J. L. Lochhead, late Medical Officer, Nigeria, becomes Medical Officer, Gambia, and Dr. J. M. Semple, Medical Officer, Zanzibar, Senior Medical Officer, Uganda.

DEATHS IN THE SERVICES

Col. Charles Robert Tyrrell, C.B., C.B.E., late R.A.M.C., who passed away in his sleep at Folkestone on August 12th at the age of 75, was a Middlesex man who qualified in 1881 with the membership of the Royal College of Surgeons of England and the licentiate of the Society of Apothecaries. He entered the Army in the following year, and in 1897–98 saw service on the North-West Frontier of India (despatches and medal with clasp). He retired in 1912, but was re-employed during the late war. From 1914 to 1917 he was at the War Office, and for one year afterwards was commissioner of medical services at the Ministry of National Service. Col. Tyrrell was made a Knight of Grace of the Order of St. John of Jerusalem in 1913, received the C.B. in 1917, and the C.B.E. two years later. In 1900 he married Agnes Laura, daughter of the late James Livesey, by whom he had one son.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 4TH, 1934

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 0; scarlet fever, 2400; diphtheria, 1088; enteric fever, 36; acute pneumonia (primary or influenzal), 438; puerperal fever, 46; puerperal pyrexia, 97; cerebro-spinal fever, 10; acute poliomyelitis, 16; acute polio-encephalitis, 1; encephalitis lethargica, 6; dysentery, 14; ophthalmia neonatorum, 107. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 13th–14th was as follows:—Small-pox, 0; scarlet fever, 1431; diphtheria, 1446; measles, 542 (last week 650); whooping-cough, 269; puerperal fever, 25 mothers (plus 6 babies); encephalitis lethargica, 268; poliomyelitis, 1; "other diseases," 243.* At St. Margaret's Hospital there were 22 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 13 (1) from measles, 9 (1) from scarlet fever, 13 (5) from whooping-cough, 39 (6) from diphtheria, 48 (18) from diarrhœa and enteritis under 2 years, and 8 (1) from influenza. The figures in parentheses are those for London itself.

Manchester and Sheffield each reported a death from enteric fever. Only three towns (Sunderland, Tynemouth, and Birmingham) had as many as 2 deaths from measles. Four fatal cases of diphtheria were reported from Liverpool. Liverpool, again with 5, showed the highest number of deaths from diarrhœa, Gillingham 3, no other large town more than 2.

The number of stillbirths notified during the week was 280 (corresponding to a rate of 41 per 1000 total births), including 49 in London.

* Last week this figure should have been given as 247.

MEDICAL NEWS

University of Cambridge

On August 4th the following degrees were conferred:—

M.D.—C. G. H. Campbell, J. K. Monro, W. G. Oakley, B. C. Tate, K. H. Uttley, J. M. Graham, and A. W. Langford.

M.B. and B.Chir.—J. D. Fergusson, W. H. Lewis, Kenneth Robson, Alan Kekwick, and A. C. Rumsey.

M.B.—P. T. Cooper and C. M. Carr.

B.Chir.—R. C. F. Catterall, A. H. Dunkerley, M. K. Martyn, and C. J. Martin (by proxy); W. A. Elliott, M. W. L. Owen, T. A. Ratcliffe, A. M. Barrett, J. R. Chambers, J. G. Connell, T. B. L. Bryan, J. F. Edwards, R. E. K. Levick, C. G. Pantin, R. J. Still, E. A. M. Halsted, L. A. Hawkins, and J. P. S. Peck.

University of London

Dr. Amy M. Fleming has been appointed to succeed Dame Louise McIlroy in the university chair of obstetrics and gynæcology tenable at the London (Royal Free Hospital) School of Medicine for Women.

Dr. Fleming, who is 37 years of age, is at present senior assistant in the gynæcological department of the University of Glasgow. She was educated at Glasgow, where she graduated as B.Sc. with special distinction in 1919, and M.B. in 1922, proceeding to the degrees of M.D. and D.Sc. in 1927 and 1933. In 1924, after holding appointments in anatomy and urology, she became external assistant in the obstetrical and gynæcological hospital of the University of Tübingen. She also spent three months in 1923 working in the maternity hospitals of Vienna, and visited other continental cities between 1925 and 1929. In 1925 she joined the staff of the Royal Samaritan Hospital for Women, Glasgow, and in 1928 she was the first woman to be appointed to the staff of the Glasgow Royal Maternity and Women's Hospital, where she is now assistant surgeon and acting pathologist and director of the laboratory. Since 1923 she has been engaged in research work with the aid of grants from the Carnegie trust, the Muirhead trust, and the Medical Research Council, and has published observations on the peripheral innervation of the uterus and other subjects. She is an examiner for the Central Midwives Board for Scotland, and was elected a member of the British College of Obstetricians and Gynæcologists in 1931.

London Hospital Medical College

A post-graduate course will be held at this college from Oct. 17th to Oct. 20th, and the old students' dinner will take place on Oct. 18th at 7.30 P.M.

A Congress of Medical Wine-lovers

The second national congress of the Médecins Amis des Vins de France will be held at Béziers from October 25th to 28th, under the honorary presidency of Mr. Gaston Doumergue, the French premier. The secretary of the congress may be addressed at 72, Allée Paul Riquet, Béziers.

Experiments on Living Animals

Dr. J. A. Giles has reported to the Home Office on experiments performed in Great Britain during the year 1933 under the Cruelty to Animals Act of 1876. The total number of licensees holding certificates under the Act was 1647, of whom 398 performed no experiments. Of the 603,240 experiments performed during the year, 140,000 were performed by 308 licensees for Government departments and public health authorities, while 254,000 experiments by 66 licensees were made in the preparation of serums and the testing of drugs. Of the 575,055 experiments without anæsthetics most were inoculations and feeding experiments, a certain number consisting of oral administrations, inhalations, external applications, and abstraction of body fluids. It should be noted that Certificate A which allows experiments to be performed without anæsthetics is granted only for such as are attended by no considerable pain. The certificate is in fact not required to cover the operative procedure but to allow of the subsequent course of the experiment. "It must not be assumed," Dr. Giles remarks, "that the animal is in pain during the whole of this time. In cases of prolonged action of an injected substance, even when ending fatally, the animal is generally apparently well, and takes its food as usual, until a short time before death. The state of illness may only last a very few hours, and in some cases it is not observed at all." Only three irregularities were reported during the year, all of them trivial, and the result of misunderstanding of the regulations. Dr. Giles works under an advisory committee of which Lord Tomlin is chairman, composed of Dr. H. Morley Fletcher, Sir Farquhar Buzzard, Mr. W. Sampson Handley, Sir D'Arcy Power, and Mr. Wilfred Trotter.

From Theatre to Hospital

The Surrey Theatre, in Blackfriars-road, has been sold to the adjoining Royal Eye Hospital, and it is intended to build a new hospital on the site. Since the theatre, long the home of "transpontine melodrama," was opened in 1782 it has twice been burned. "Black-Eyed Susan" was first produced there a century ago.

An Artificial Slum

A slum alley built from materials collected in a London clearance area will be a feature of the nineteenth (biennial) Building Exhibition which is to be opened at Olympia, London, on Sept. 12th, by Lord Balfour of Burleigh. It will form the entrance to the "new homes for old" exhibit, which will include a survey of recent housing developments and the relation of housing to town planning.

Memorial to David Livingstone

A statue to Dr. Livingstone was unveiled by his nephew, Mr. H. U. Moffat, a former premier of Southern Rhodesia, on August 5th, at Victoria Falls. The memorial has been erected by the Federation of Caledonian Societies of South Africa. It is the work of Mr. W. Reid Dick, R.A., and takes the form of a bronze figure of the explorer standing on an immense base of Rhodesian granite. The ceremony was relayed in the National programme, and wireless listeners in this country were able to hear the speeches and the roar of the water.

A New West Riding Mental Hospital

The mental hospitals board of the West Riding has decided to build a new institution for 1000 patients. A site has yet to be found; about 100 acres will be required, and the locality is to be selected with a reference to the incidence of lunacy in the various areas of the West Riding. A further 559 beds are to be provided in existing institutions by converting buildings at present used for other purposes, and by adding an admission block at Menston Hospital.

Tunbridge Wells Hospital

On August 8th, at the first meeting of the governors of this new large institution by which the Tunbridge Wells and Counties General Hospital and the Tunbridge Wells Eye and Ear Hospital have been amalgamated, the Marquess of Abergavenny was elected patron and the Marquess Camden president. In reply to criticisms Mr. J. B. Snell, on behalf of the building committee, said the cost of erecting a modern hospital was £1000 per bed. The institution had 204 beds, and would therefore have been justified in spending £204,000, whereas the total cost of the building had, in fact, only been £180,000. The committee felt the change from 165 beds, as was originally proposed, to 204 beds was wise, and would meet the requirements of the hospital's area for many years to come. The upkeep of the hospital would be approximately £500 per week.

University of Durham College of Medicine

A special post-graduate course is announced by the college between the dates of Sept. 10th and 21st inclusive. The courses include, among others, lectures and demonstrations on Orthopædic Surgery (Mr. C. Gordon Irwin), Ophthalmology (Mr. J. S. Arkle), Pædiatrics (Dr. J. C. Spence), Diseases of the Throat, Nose, and Ear (Mr. W. F. Wilson), Pathology and Bacteriology (Prof. S. McDonald and Prof. E. M. Dunlop), Neurology (Dr. C. N. Armstrong), and Gynæcology (Dr. E. F. Murray). The majority of the classes will be held in the Royal Infirmary, where Dr. W. E. Hume, Dr. H. Drummond, Dr. A. G. Ogilvie, Mr. F. C. Pybus, and Mr. R. J. Willan will give medical and surgical demonstrations. Dr. J. A. Charles will lecture on infectious diseases at the City Hospital, and Prof. R. P. Ranken Lyle and Mr. H. Harvey Evers will give gynæcological instruction at the Princess Mary Maternity Hospital. For the time chart of the various days, and the locale of the lectures and demonstrations information should be sought from the registrar of the College.

Appointments

Certifying Surgeons under the Factory and Workshop Acts: CURSHAM, A., L.R.C.P. Lond., M.R.C.S., Halesworth (Suffolk); FIDDIAN, G. V., M.B., B.Chir. Camb., Torrington, (Devon).

Vacancies

For further information refer to the advertisement columns

Aberdeen City Mental Hospital, Kingseat, Newmachar.—Asst. M.O. £300.
Altrincham General Hospital.—Sen. H.S. At rate of £150.
Birkenhead Municipal Hospital.—Deputy Med. Supt. £450. Also Res. M.O. £300.
Birmingham and Midland Eye Hospital.—Res. Surg. O. At rate of £130.
Birmingham Maternity Hospital.—Res. M.O. and Reg. £200.
Birmingham, Queen's Hospital.—Res. Med. Reg. £200. Res. Surg. O. £150. Also Res. Surg. Reg. £100.
Birmingham, Royal Cripples Hospital.—Res. H.S. At rate of £200.
Board of Control, Caxton House West, Tothill-street, S.W.—Commissioner. £840.
Bradford Children's Hospital.—H.S., and H.P. Each £100.
Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £100.
Brighton, Royal Sussex County Hospital.—H.S. Also Cas. H.S. At rate of £150 and £120 respectively.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350.
Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.
Cardiff, Glan Ely Tuberculosis Hospital, Fairwater.—Asst. Tuberculosis M.O. £500. Two H.P.'s. Each at rate of £100.
Cardiff, King Edward VII. Welsh National Memorial Association. Three Asst. Tuber. O.'s. Each £250.
Cardiff, University College of South Wales and Monmouthshire.—Asst. Lecturer in Dept. of Physiology. £400.
Chester Royal Infirmary.—H.S. £150.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.
Cobham, Surrey, Schiff Home of Recovery.—Res. Surg. O. £200.
Colchester, Essex County Hospital.—Asst. H.S. £120.
Derby, Derbyshire Education Committee.—Asst. School M.O. £500.
Derby, Derbyshire Hospital for Sick Children.—Res. H.P. At rate of £130.
Derby, Derbyshire Royal Infirmary.—H.S. £150.
Dreadnought Hospital, Greenwich, S.E.—H.P., and H.S. Each at rate of £110.
Dudley, Guest Hospital.—Second H.S. £170.
Dumfries and Galloway Royal Infirmary.—Part-time Med. Supt.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £200.
Edinburgh, Royal College of Physicians.—Whole-time Fellowship, £300; Part-time Fellowship, £100.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
Golden-square Throat, Nose and Ear Hospital, W.—H.S. £100.
Great Yarmouth General Hospital.—H.S. £140.
Halifax, St. Luke's Hospital.—Jun. Res. M.O. £250.
Hospital for Tropical Diseases, Gordon-street, W.C.—H.P. At rate of £120.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—H.S. to Sutton Branch Hospital. At rate of £160.
Institute of Ray Therapy, &c., 152 Camden-road, N.W.—Part-time M.O. At rate of £100.
Lancaster, County Mental Hospital.—Asst. M.O. £500.
Leeds General Infirmary.—Hon. Orthopædic Surgeon.
Lincoln County Hospital.—H.S. At rate of £150.
Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £100.
Liverpool Royal Infirmary.—Two H.S.'s to Spec. Depts. Each at rate of £60.
Liverpool, Royal Southern Hospital.—Res. Orthopædic H.S., M.O. to Spec. Dept., and Res. Anæsthetist. Each at rate of £60.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Manchester Babies Hospital, Burnage-lane, Levenshulme.—Sen. Res. Medical Officer. At rate of £125.
Manchester, Booth Hall Hospital.—Two Asst. M.O.'s. Each £200.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Hon. Asst. Laryngologist.
Manchester Royal Infirmary.—First Asst. for Clinical Laboratory. £350.
Manchester, St. Mary's Hospitals.—Hon. Surgeon for Children's Dept.
Margate and District General Hospital.—Res. M.O. £150.
Middlesbrough, North Riding Infirmary.—Third H.S. At rate of £125.
Middlesex Hospital, W.—Radiologist. £500. Also Asst. Radiologist (Diagnostic). £100.
Newcastle General Hospital.—Two Surg. Regs. Each £250.
Newcastle-upon-Tyne Eye Hospital.—Sen. Res. H.S. £300.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Jun. Surg. Reg. £150.
Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £120. Also H.S. to Spec. Depts. £120.
Poplar Hospital for Accidents, East India Dock-road, E.—Second Res. O. £175.
Port Elizabeth, Provincial and City Infectious Diseases Hospitals. Med. Supt. £1000.
Preston County Borough.—Asst. School M.O. £500.
Prince of Wales's General Hospital, N.—Res. Jun. H.P., and Two Res. Jun. H.S.'s. Each at rate of £90.
Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—Res. M.O. At rate of £150. Also H.P. and Cas. O., H.S. and Cas. O. Each at rate of £110.
Queen Mary's Hospital for the East End, Stratford.—H.S.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist. At rate of £150.
Rhondda U.D.C.—Asst. M.O. £500.
Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.
Royal London Ophthalmic Hospital, City-road, E.C.—Out-patient Officer. £100.
Royal Naval Medical Service.—Ten M.O.'s.
Royal Northern Hospital, Holloway, N.—Clin. Asst. for Aural Dept.
St. Albans and Mid Herts Hospital and Dispensary.—Res. H.S. £150.
St. Albans, Cell Barnes Colony.—H.P. £155–£165.
Sheffield Children's Hospital.—H.P. At rate of £100.
Shrewsbury, Royal Salop Infirmary.—Cas. O. and Res. Anæsthetist. At rate of £160.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. and Asst. H.S. £150 and £125 respectively.
Surrey County Council.—Asst. M.O. £600.
Swansea County Borough.—Asst. M.O. £500.
Swansea General and Eye Hospital.—Cas. O. At rate of £150.
Tilbury Hospital, Essex.—H.S. At rate of £140.
Walsall, Manor Hospital.—Jun. Res. Asst. M.O. £150.
Warwick, King Edward VII. Memorial Sanatorium, Heriford Hill.—Jun. Asst. M.O. £200.
Warwickshire and Coventry Joint Committee for Tuberculosis.—Asst. Tuber. O. £600.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West Bromwich and District General Hospital.—H.S., H.P., and Cas. O. Each at rate of £200.
West London Hospital, Hammersmith-road, W.—H.P. Also 2 H.S.'s to Special Depts. Each at rate of £100.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Hon. Asst. Surgeon.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Fochabers (Morayshire), and at Manchester, W.C. (Lancs.).

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On August 12th, at St. John's Hill, Shrewsbury, the wife of Frederick A. Anderson, M.D., of a son.
MEAD.—On August 12th, at Victoria-road North, Southsea, the wife of Dr. Kenneth V. Mead, of a son.
TAYLOR-JONES.—On August 11th, at West Cross, Tenterden, Kent, the wife of Dr. T. H. E. Taylor-Jones, of a daughter.

DEATHS

COLLINGWOOD.—On August 9th, at Marlborough Hill, N.W., Bertram James Collingwood, M.D., O.B.E., Professor of Physiology, University of London.
ELLIOTT.—On August 10th, at The Shrubbery, Stonegyate, Leicester, Charles Coyne Elliott, M.D., F.R.C.S.E., aged 58 years.
HILL-WILSON.—On August 8th, after a long illness, Dr. A. E. Hill-Wilson, late of Stamford Brook-road, London, W.
LOWENTHAL.—On August 14th, at Bognor Regis, Sussex, Louis Lowenthal, M.D. Chicago, M.R.C.S., L.R.C.P., aged 58, dearly beloved husband of Frida Lowenthal. Funeral will leave 344, Finchley-road, Hampstead, Friday, August 17th, for the Liberal Jewish Cemetery, Pound-lane, at 10.30. No flowers by request. (American papers please copy.)
MASON.—On August 12th, at Oakwood, Walton-on-Thames, Arthur Henry Mason, M.R.C.S., L.R.C.P., aged 74.
MOORHEAD.—On August 3rd, at a nursing-home, Dublin, George A. Moorhead, F.R.C.S.I., of Tullamore, in his 79th year.
TYRRELL.—On August 12th, Charles Robert Tyrrell, C.B., C.B.E. (late R.A.M.C.).
WINTLE.—On August 8th, at Bath, Colston Wintle, M.R.C.S., L.R.C.P., J.P. for Bristol.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1934

THE Index and Title-page to Vol. I., 1934, which was completed with the issue of June 30th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NOTES, COMMENTS, AND ABSTRACTS

"HEART" LATHAM

By Major Greenwood, D.Sc., F.R.C.P., F.R.S.
PROFESSOR OF EPIDEMIOLOGY AND VITAL STATISTICS IN THE UNIVERSITY OF LONDON, AT THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

"I was told," wrote Sir Thomas Watson, whose years and honours permitted him to use a freedom which in others *might* have been thought disrespectful, "by a profound classical scholar, who was possessed with the strange curiosity to read all the printed Harveian Orations, that subsequently to the date of Sir George Baker's, that by Dr. P. M. Latham was one of the very few the Latinity of which he could praise." [1]

Between Baker's oration (1761) and P. M. Latham's (1839) 24 Harveians were printed and one wonders whether that of Dr. John Latham (1794), Peter Mere Latham's father, was also one of the very few praiseworthy exercises in Latin prose. Ability to write decent Latin prose was one of the points in which Peter Mere Latham resembled another hero of the London College of Physicians, John Freind; some might think it the only point. What else could there be in common between the jolly, enjoying, English gentleman of the very early eighteenth century, who cracked his joke and his bottle, served in Spain with Peterborough, and was actually sent to the Tower, and the "very small, spare man . . . with an instinctive shrinking from remediless suffering, which, I remember hearing, led him sometimes to fail in keeping appointments for consultations in cases that were beyond hope, and this was perhaps an indication of one of the few defects in his character—a reluctance to encounter pain or to engage in struggle even when his convictions would have led him to do so." [2]

As I think I shall be able to show, there were other points of resemblance between the physician who died more than 200 years ago and the physician with whom men now living may have spoken.

Peter Mere Latham was born in 1789, the son of a physician who reached the highest rank in his profession and also lived to a venerable age. He was educated at Oxford and St. Bartholomew's Hospital, elected physician to the Middlesex Hospital in 1815 and to St. Bartholomew's Hospital in 1824 (when he resigned his office at the Middlesex Hospital). For the next 17 years he was an active, perhaps the most active, member of the Bart.'s staff, but in 1841 he resigned his office on account of ill-health, although he continued to practise in London for another 24 years, not retiring until 1865, when he was long past 70, and he survived until 1875, dying in the eighty-seventh year of his age. Those who are interested in such matters will remark a parallel between the careers of father and son. John Latham at the age of 46 in leading consulting practice "was worn out by the hard labour of his early success. He was believed to be consumptive, and he retired into the country, it was thought to die." (This and the following quotations are from a biography of John Latham by his son Peter.) "Under the influence of country air and complete relaxation from the cares and toils of professional business" John Latham recovered. He returned to London, moved from Bedford-row to Harley-street, "and here for years he enjoyed, with a more moderate practice, a larger share of health than he had known during the days of his greater labour and greater success." He did not in fact retire from practice until he was in his sixty-eighth year, and lived in retirement another 14 years. "He was singularly temperate, when temperance was hardly yet thought to be a virtue: he was most pure in life and conversation when to have been otherwise would have provoked no censure; and he was not ashamed to be religious when religion had yet no recommendation or countenance from the world."

"The son was also (I am now quoting from Munk, who derived his information from Peter Latham's pupil, Charles West) the Christian physician. Side by side with the pharmacopœia on his consulting room table, in the little book-stand, stood hidden in the plainest binding his Greek Testament and Bishop Andrews' 'Devotions,' and he loved them both." The father's physical weakness we have been told was a tendency to consumption, that of the son, "emphysema of the lungs and severe paroxysms of asthma." Should any of our medical psychologists go further into the family history of the Lathams, I cannot doubt but that very striking proofs of mutually incompatible hypotheses will easily be discovered.

WORKS AND OPINIONS

Peter Mere Latham's literary output was considerable. An edition of his works was edited for the New Sydenham by the late Robert Martin. The clinical lectures on diseases of the heart, which earned the nickname "Heart" Latham, were once popular in the profession. So far as the practice of competent physicians is concerned, in a large majority of the illnesses described by Latham the passage of 90 years has brought no fundamental change in methods of diagnosis or treatment. For that very reason his book is hopelessly obsolete; one can learn the facts better from books of to-day and there is not sufficient contrast between what was thought then and now either to flatter our vanity or to excite our antiquarian curiosity. The author's literary skill, although distinguished, is not distinguished enough to make him immortal on that account. In spite of the decay of what was once called humane learning, medical men of our own time, such as Osler and Allbutt, have written in the same vein as well as Latham.

It is, however, worth while to quote some passages of this book in order to illustrate Latham's medical philosophy. I take the following from his lectures on acute rheumatism.

"Acute rheumatism has experienced strange things at the hands of medical men. No disease has been treated by such various and opposite methods. Venaesection has wrought its cure, and so has opium, and so has calomel, and so has colchicum, and so have drastic purgatives. I speak of these remedies in the sense which medical men imply when they talk (as they sometimes do) of this, that, or the other thing being their 'sheet anchor'; meaning that they rest upon it alone for the cure of the rheumatism, and employ other remedies either not at all, or for very subordinate purposes. And indeed I bear my testimony to the success of each of these different remedies, so far as that, under the use of each, I have seen patients *get* well. . . It is not possible that the treatment of disease shall be ever set at rest by the consent of physicians, or that fixed and uniform plans and remedies shall ever be adopted in cases bearing the same nosological name and character. At least it cannot be until each disease has its own specific antidote, or until each has

[1] This, and other quotations not separately specified, is from the New Sydenham Society's Edition of Latham's Works.
[2] Munk's Roll of the Royal College of Physicians, vol. iii., p. 188.

disclosed some seminal principle from which it springs, and shown where it is: some principle, too, it must be which is within reach, and which is destructible and easily destroyed. . . For the treatment of acute rheumatism, above all other diseases which can be named, is a thing to put the physician and medicine itself to the trial of what they can really do. Here are no specifics at hand. All proceeds upon rational calculations; upon the right choice of purposes to be fulfilled, and the right choice of means to fulfil them. . . Let me repeat my testimony to the success of this practice in acute rheumatism; the practice, namely, of choosing some single indication, and steadily pursuing it to its fulfilment. It is a very rational practice. . . . Well, then, I am persuaded that when the physician is called upon to perform great things, even to arrest destructive disease, and to save life, his skill in wielding the implements of his art rests mainly upon the right understanding of simple and single indications, and of the remedies which have the power to fulfil them. To know that, in any case of acute rheumatism, the cure of the entire disease is accessible through the blood-vessels alone, by subduing their too forcible action; or accessible through the nervous system alone, by moderating its disquietude, and abating pain; or accessible through the stomach and bowels and liver alone, by stimulating them to a very large amount of secretions: and to know, moreover, that in any cases venaesection alone will fulfil the first purpose, or opium alone will fulfil the second, or calomel and aperients alone will fulfil the third: to know all this is the best preliminary step towards enabling us to deal safely and successfully with other and more numerous cases, which need a more complex method of treatment, and require that all these important purposes be pursued simultaneously, and all these great remedies be made confederate for the cure of the disease."

It will be seen that Latham's philosophy was essentially pragmatic. He had no more use than Freind for any subtle disquisition on the essential nature of a "disease." He flourishes a little over the "seminal principle of diseases" (meaning, no doubt, the *causa efficiens*, or biological excitant of an illness) and holds that the "highest office of medicine is to minister to diseases (again meaning illnesses) which by themselves, or by their incidence, go directly and rapidly to the destruction of life." Actually he is doing what all physicians must, in 90 per cent. of cases, do, treating symptoms, taking events as they come, and—this is what distinguishes the genuine physician from the charlatan—not pretending to himself that he is doing anything more.

THE CHANGES OF A CENTURY

Anybody who thinks that in 1933 physicians do much better need only refer to any modern treatise. Take, for instance, Strümpell and Seyfarth's "Practice of Medicine"[1]; it will be found that the passage of 80 years has not led to any fundamental change in the conception of acute rheumatism from the clinical aspect. In respect of treatment, shortly after Latham's death a new specific medication replaced colchicum—viz., salicylic acid—which, as sodium salicylate, had a considerable vogue, but owing to its production of some disagreeable symptoms has been to a great extent replaced by acetyl salicylic acid (aspirin) while the latter has again been replaced in some clinics by phenyl-quinolin carbonate (atophan). These remedies usually, it is said, cause the symptoms to disappear, but—

"it is only in the minority of cases that the course of the disease is at an end. There very frequently occurs, sooner or later, a relapse, with renewed pain or even effusion in one or more of the joints. . . It is an unfortunate fact that the efficacy of all remedies against acute rheumatism is limited. . . Much discussion has taken place on the possible influence of salicylic preparations and atophan upon the occurrence of complications, especially cardiac lesions. At any rate, it is certain that the latter cannot be prevented by these remedies and quite often make their appearance during the administration."

So far as treatment is concerned the physician of 1934 can relieve pain more frequently than the physician of 1844, that he can "cure" the disease more frequently does not appear. This is a simple illustration not buried in technicalities; the principle it illustrates is a general one.

Those who assert that there are no forms of illness which the pure *medical* clinician can diagnose and treat more efficiently than his great grandfather are simply liars or ignoramuses. Were they to confine themselves to saying that in seven out of ten cases of the *kind* of acute bodily illness which leads to the calling in of a Fellow of the College of Physicians in 1933, he can do nothing essentially different from what Latham would have done 100 years ago, they would be within the mark.

From this one does not, unless very unintelligent, conclude that in 70 per cent. of cases the visit of a physician is useless now and was useless a century ago. Latham explained his duty:

"According to popular notion, cure is the aim and end of all treatment, and the result and complement of successful treatment. But let cure and treatment now be taken to denote different things, so far as the aims and objects of the physician are concerned in his management of disease. Let cure be looked upon as concerned with the disease as such, and having little or no regard to the individual patient whom it befalls. Treatment is concerned with the individual patient, and leaves his disease to take care of itself. . . It is an instructive fact that, as the knowledge of disease has increased, the practice of medicine has been less and less conversant with cures and more and more conversant with treatment. . . And thus the present state of our knowledge has come to warrant the conclusion that the number of diseases is very small which are capable of cure by a proper remedy of their own, and which exclude the need of other remedies addressed to conditions belonging to the individual patients; whereas the number in which the converse obtains would embrace the vast majority of human maladies."

The physician is valuable not because of his grasp of general principles, but because of his nice observation of particular idiosyncrasies of human beings.

It is in his insistence upon this aspect of medicine that Latham becomes I will not say modern but very relevant to modern matters of controversy. He was an unsparing critic of medical education. In early middle life, in the lectures he published in 1836, he devoted much attention to the subject. It was the theme of his latest writing, published in the *British Medical Journal* in 1864, when he was 75. In 1836 Latham wrote:

"Depend upon it, what all men indiscriminately are told they *ought* to know, all men indiscriminately will soon *pretend* to know, be it never so extravagant; and when every medical man in every town and village throughout England, be he physician, surgeon or apothecary, shall, in right of his profession, claim the homage due to vast learning and science, there will not be wanting some Molière or Le Sage to hold us all up to the just ridicule of mankind."

Twenty-eight years later he begins his article with these words:—

"'Science is his forte, omniscience is his foible.' This was spoken by one well able to instruct mankind; and with such a lucky way of doing it, that he could wrap up wisdom in a witticism. And this was one of the wisest and wittiest things he ever said. He aimed at some individual, and perhaps hit him and made him smart. Had he aimed at our profession, would he have hit it?

[1] English translation by C. F. Marshall and C. M. Ottley, London, 1931, vol. ii., pp. 1265 et seq.

Perhaps he would; and if he had, we should only have laughed at it. For crowds keep one another in countenance where individuals feel sharply."

Latham's position was simplicity itself. He believed that *all* knowledge was good and valuable, but that for a physician the study of sick men and women was so much more valuable than anything else that it was better to bring a pupil into contact with what he regards as the realities of medical experience, uninstructed or little instructed in the ancillary sciences, than to allow him to believe that by the acquirement of general principles, attendance on lectures or reading books, the tedious study of particulars might be avoided. In 1836, or even in 1864, the demands made upon the attention of a student outside the wards of a hospital, which seemed so shocking to Latham, were trivial in comparison with what is now imposed. A curriculum of three years in 1864, became first four, then five, and now six years.

CHAOS IN THE MEDICAL CURRICULUM

There have been two causes contributory to this great evil. The first is that described by Latham in the last two quotations, professional vanity. Medical men have the same passions as other men; it is not agreeable to any professional to confess that some subject or technique falling within the scope of his profession is better understood by an "amateur"; practising lawyers do not always greet with acclamations the opinions of amateurs who may have given to the consideration of juridical problems more years than a jury advocate has given weeks. Bishops do not usually sit at the feet of lay theologians. The field of medicine is so vast that the rôle of the "amateur" is necessarily much more important than in law or theology. The sciences of physiology, experimental pathology, biochemistry, bacteriology, medical statistics, and epidemiology have to a great extent been the creation of men who have not practised medicine, many of whom have not even passed through an undergraduate medical training, and most of whom would have been as incompetent to do Latham's work as Latham would have been incompetent to do that of Thomas Young (who was a second-rate physician).

There would be no shame in recognising this fact; indeed, as the medical profession contains, like most corporations, a large majority of honourable and sensible men and women, it *has* been generally recognised. But medical education is controlled mainly by oldish people who are not only hypersensitive to professional esprit de corps but to an influence, which in Latham's time was of but minor importance, extra professional or lay opinion. During the last 60 years, almost wholly owing to the work of men of science not immersed in practice, methods and instruments have been discovered which are of value in the diagnosis and treatment of illness. When such a discovery is made, at first it is either ignored or allowed to be a matter for specialists. But, sooner or later, if the discovery is important, the general public will ask why "doctors" in general are not taught to use the method, why it should only be available to the poor in institutions and to the less poor at a special fee. In the days of our grandparents this was not so common. In the lectures he published in 1836 Latham, almost apologetically, advised his students "not to allow the period of your pupilage to pass by without making a special study of the diseases of the eye."

"Here," he said, "you see almost all diseases in miniature; and, from the peculiar structure of the eye, you see them as through a glass; and you learn many of the little wonderful details in the nature of morbid processes, which, but for the observation of them in the eye, would not have been known at all. Let every one of you *who has a few months to spare* * give them to the Eye Infirmary."

Fifteen years later one of the greatest men of science who have ever lived, Hermann von Helmholtz, invented the ophthalmoscope and put into the hands of clinicians one of the most valuable instruments for diagnosis ever constructed. As in many, but by no means all, great inventions, the principles upon which this depended were simple, and its intelligent use could be acquired in a few months of careful practice. Its use did not, however, form part of the compulsory routine of medical instruction for many years. Even so recently as my own pupilage at the beginning of this century, it was quite possible to obtain a medical qualification without ever having handled an ophthalmoscope. Yet it is true that, quite apart from special diseases of the eye, the use of this instrument is of great importance in establishing the diagnosis of serious bodily diseases admittedly within the province of the general physician.

Public demand for knowledge of the applications of more recent discoveries has been much more urgent. Within our own generation, thanks, as in the case of the ophthalmoscope, not to physicians or surgeons but to men of "pure" science, physical means of diagnosis and treatment covered by the general term radiology have been introduced. The demand for incorporation of knowledge of these matters in the medical curriculum has not had a latent period of 30 or 40 years. Here, however, has arisen a difficulty. While it is possible to explain the principles of the ophthalmoscope and retinoscopy to any intelligent person with no more knowledge of physics and physiology than most boys of 16 have, or might have, in the fifth form of a secondary school, the physical principia of radiology are by no means axiomatic.

Hence arises a conflict of motives in the minds of the more or less elderly controllers of medical education. They will, of course, have to face the public demand that all "doctors" should be able to use new methods. Three courses are open to them.

The first is to say that, valuable as such things may be, they are only of value in so small a proportion of the cases with which a general physician has to deal that they may well be let alone. The second is to say that, just as no government has ever required the drivers of motor-cars to understand the scientific principles involved in their construction but only evidence that the drivers can drive, they will require no more than that the student shall be able to put the methods to their simpler uses. The third is to say that they will insist upon a knowledge of both theory and practice.

The first course is not open to them in the particular case chosen, since all men know that an X ray picture is an extremely valuable aid to common diagnosis. It *is* often open to them in other cases, but to follow it is repugnant to professional esprit de corps; one has the psychological situation described by Latham. To follow the second course, plainly and honestly, is also hurtful to esprit de corps, and in some instances might be harmful to the general public.

I suppose, but speak with doubt, having no expert knowledge, that a man entirely ignorant of physics who diligently studied X ray photographs, checking his impressions by other evidence, might be able to use

* The italics are mine.

such pictures for diagnostic purposes with well-justified confidence. Many good drivers of motor-cars have the haziest notion of *how* the engine or even the brakes really work, and some excellent engineers are very bad drivers. But to apply the diagnostic and therapeutic procedures of, say, a psycho-analyst, without a good deal more knowledge of the psyche than can be learned from partisan or purely technical books and papers would be a rushing in of fools where angels fear to tread, with a vengeance. Consequently in practice a more or less illogical compromise between the second and the third courses is always adopted.

The result has been unhappy. All men recognise that the medical curriculum is chaotic, but how to reduce the chaos to order is in dispute. Perhaps a hint, if not to the solution, at least to the direction in which it lies, is contained in a quotation with which I end.

"Many a great chemist, a great botanist, or a great master of analysis, may be found to contend that what he has to teach is indispensable to the medical student; that the principles of his science are at the root of all rational practice. But beware of great authorities. They have a tyrannous way with them. They make common sense afraid to stand up and say what it knows to be right. Believe them and they would commit the student to the whole circle of the sciences and make him unhappy because he finds himself unable to follow his leaders. Surely there must be some shorter and easier way than theirs of making physicians and surgeons, and yet a safe way withal, or it will fare badly with mankind.

"Now I have my own little suggestion to offer. It is a humble one, but not unbecoming wise men to adopt; a humble one, but bringing no loss of glory to the profession in the end. Have a very great care, then, of your medical student, and how you guide him at starting. Now especially is the time for good advice, if you have any to give. Take him now into the wards of the hospital at once: fit or unfit, as people reckon fitness, thither take him. He may have learnt all sorts of things already, or he may scarcely have learnt anything at all. But as soon as you have become his masters, thither take him, and there let him remain and make it for the present his sole field of observation and thought, or curiosity, and have a guard that the best things from without do not reach him there, to his hindrance or destruction."

NEW PREPARATIONS

TANNA-FLAVIN (British Drug Houses, Ltd., Graham-street, City-road, London, N.1).—This preparation is designed for the prompt treatment of burns and scalds. The powder contains, in addition to tannic acid, a measured quantity of acriflavine, of which the non-irritating but germicidal qualities are familiar. The solution of the powder is made by dissolving a packet of the tanna-flavin in warm sterile water and adjusting the volume of the solution to 100 c.cm. (3½ fluid ounces approximately). The resulting solution contains 20 per cent. of tannic acid and 0·1 per cent. (1 in 1000) acriflavine B.D. The following passage is from the report of the Mines Department on the medical treatment of men burned in colliery explosions: "There is now a substantial body of evidence that the tannic acid method of treatment has greatly reduced the mortality from burns of moderate extent, and, in our experience, burns which involve up to one-third of the body surface, when so treated, prove fatal only in exceptional circumstances. We believe, therefore, that a more general employment of this method would lessen the mortality after colliery explosions by preventing death in all but the cases of extensive involvement."

MENOSTATICUM (Coates and Cooper, Ltd., 94, Clerkenwell-road, London, E.C.1).—This ergot preparation is manufactured at the Messrs. Temmler Chemical Works, Berlin; Messrs. Coates and Cooper acting as agents for its distribution. Its value as a hæmostyptic is testified to by German medical authorities, one of whom publishes a collective record of cases of hæmorrhage treated by the drug at the gynæcological department of the Elisabeth Hospital, Breslau. Dr. Gerhard Niessing sums up his experience by saying that excellent results were obtained in lying-in cases, and that no undesirable effects were produced by a dosage of one teaspoonful three times daily, which was the routine procedure. Each teaspoonful of menostaticum contains extr. secale cornut., 1·0 g.; oxymethylhydrastinin, 0·01 g.; extr. capic. burs. past., 0·3 g.; extr. viburni prunif., 3 g.; extr. chamomil., 0·3 g.

MATERNAL MORTALITY AND ANTENATAL SUPERVISION

THE Queen's nurses and village nurse-midwives attended during 1933, according to a report which just reaches us from the Queen's Institute, 64,144 confinements, and for the larger part without medical aid of any kind. In 31·5 per cent. of the cases medical aid was sent for on the mother's account; in 5·4 per cent. on the infant's account. The number of maternal deaths was 145, being a rate of 2·26 per 1000 live births, as compared with 2·1 in 1932 and 1·7 in 1931. The maternal mortality-rate has therefore followed the trend noted elsewhere, as set out in the Ministry of Health's annual report. It is interesting to note that among these 145 cases (2 more in number than last year) there is a decrease in fatal eclampsia from 16 to 4 and an increase from 9 to 20 in deaths from embolism which practically evens out. Particulars of the 49 deaths from sepsis are as follows:

Forceps deliveries	7	Infected by members of their families who had infective discharges	3
Ruptured perineums	10	Auto-infection from various causes	6
Placental difficulties	3	Known (or suspected) to have attempted abortion	6
Cæsarean section	1	Fæcal fistula before labour	1
Laparotomy	1		
Birth before arival of midwife	2		
Infected by midwives (one a carrier of streptococcus)	4		

Antenatal supervision continued to improve during the year although it is stated that in many cases too few visits were made during the last two months of pregnancy. Of 10 deaths occurring among women whose pelvic measurements were small, 3 had been passed by a doctor as suitable for attendance by a midwife and 2 had refused further advice. The report states that from several sources news had reached the Institute of deaths caused by lowered vitality and lack of resistance to any complications that might arise. In 38 cases there was a specific mention of poverty-stricken homes. These observations should be put alongside the facts mentioned in a leading article on antenatal care in another part of this issue. The stillbirth-rate in the series was 30·8 per 1000, the neonatal death-rate 22 per 1000.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, Wimpole-street, London, W.

MONDAY, August 20th, to SATURDAY, August 25th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Lecture-demonstration, illustrated by cases, by Dr. A. E. Clark-Kennedy, on Asthma, at 2.30 P.M., on Tues.—PANEL OF TEACHERS. Individual Clinics in various branches of Medicine and Surgery are available daily.—Courses, clinics, &c., arranged by the Fellowship of Medicine are open only to Members and Associates.